vol. I no. 4
January, 1942

School Shop

FOR INDUSTRIAL ARTS & VOCATIONAL EDUCATION TEACHERS

Safety in the School Shop
by G. C. Cook

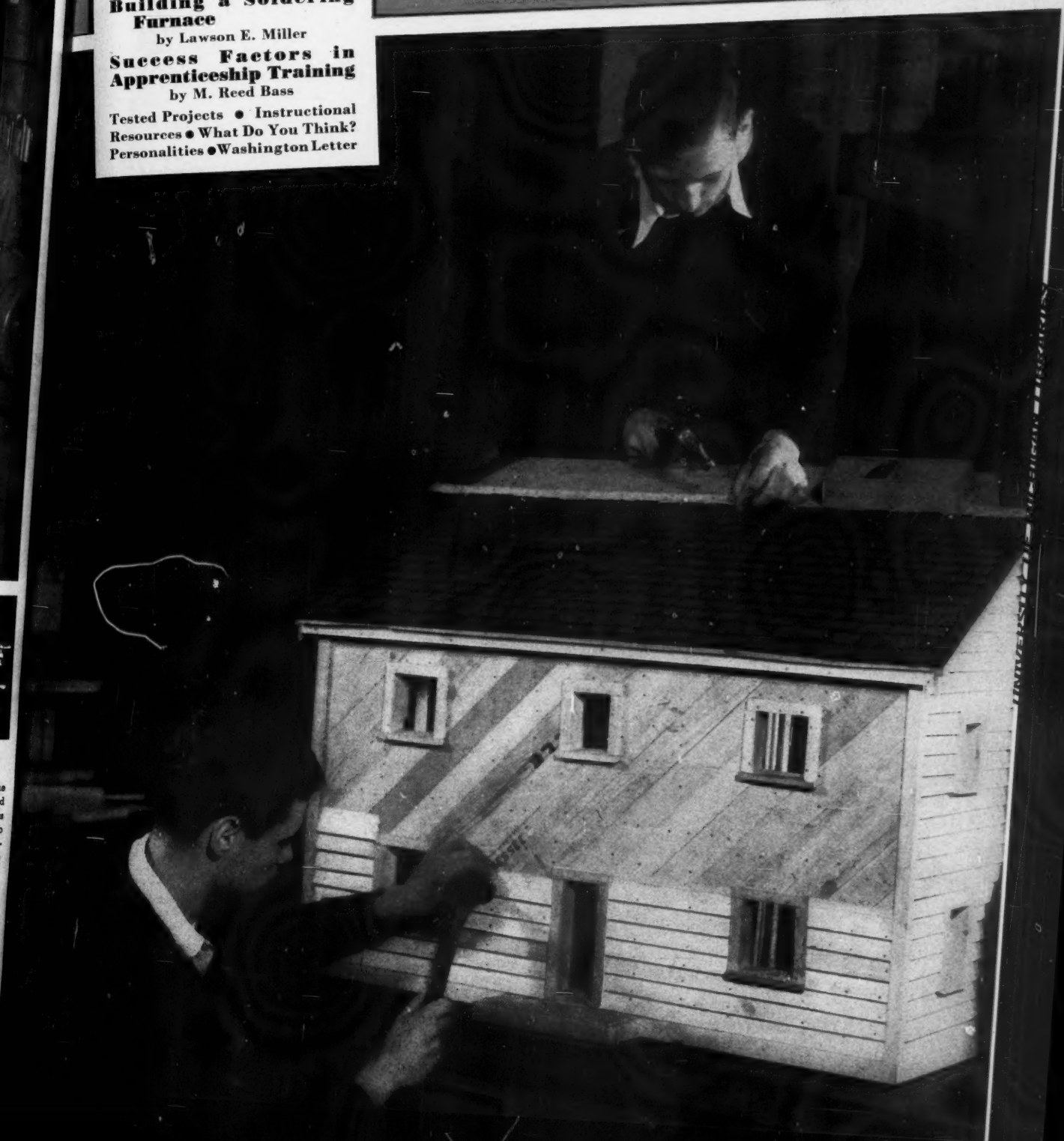
A Streamlined Approach to Drafting
by August Flam

The War and Industrial Education

Building a Soldering Furnace
by Lawson E. Miller

Success Factors in Apprenticeship Training
by M. Reed Bass

Tested Projects • Instructional Resources • What Do You Think? Personalities • Washington Letter



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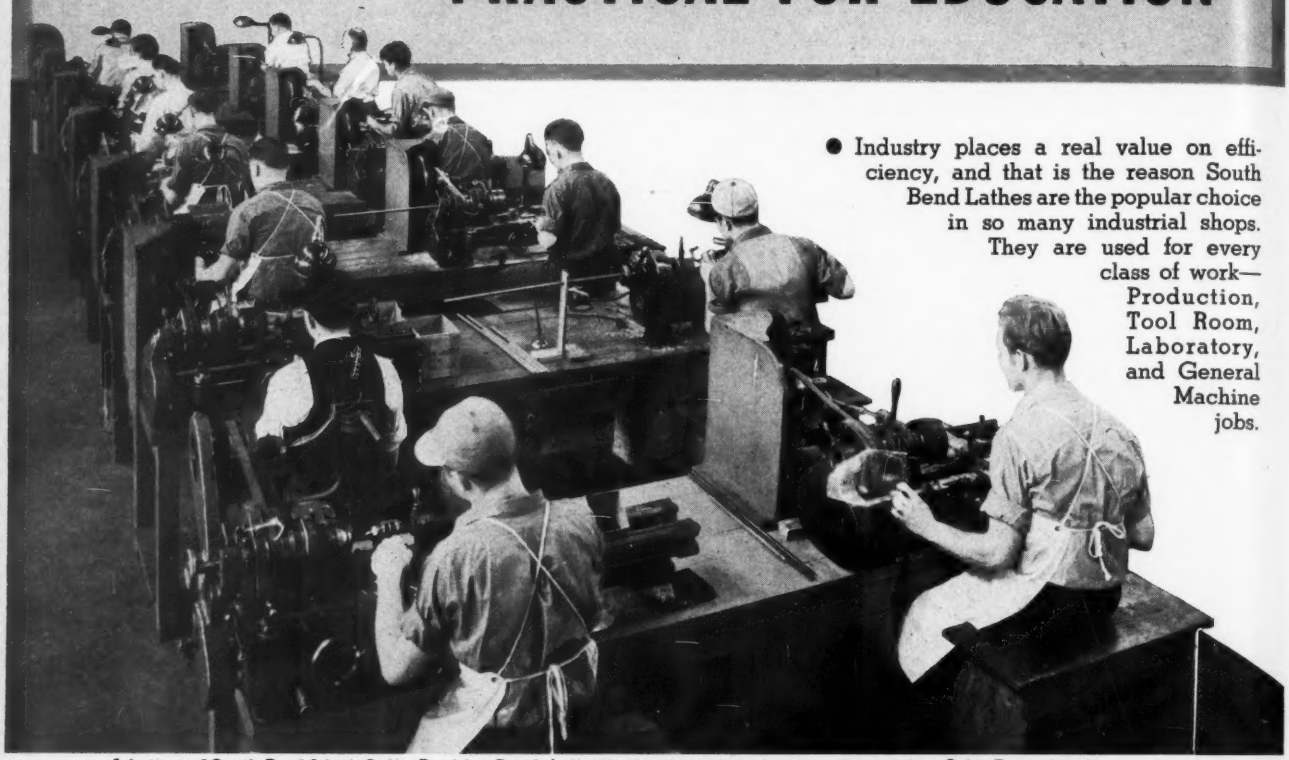

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School Shop

FOR INDUSTRIAL ARTS & VOCATIONAL EDUCATION TEACHERS

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The WAR and Industrial Education

WAR is upon us.

Regardless of our former attitude on the foreign policy of our government, the fact now is that we have been attacked and that more attacks will come.

But one objective now motivates our Nation—the defeat of the enemy so that the security of our Nation's peoples and ideals may be maintained.

Unification of the Nation for this objective has been accomplished with lightning-like rapidity.

Long before our active entry into the conflict, the schools have given a magnificent display of their ability to perform vital services in the hour of need.

Last July a letter was sent to President Roosevelt by S. D. Shankland, Executive Secretary of the American Association of School Administrators; L. H. Dennis, Executive Secretary of the American Vocational Association; and Willard E. Givens, Executive Secretary of the National Education Association, recounting the achievements of the first year of defense training. It said, in part, that from July 1, 1940, to July 1, 1941, the schools have:

> . . . trained more than a million and a half persons for defense industries. This, we may add, is more than twice the number which education promised to train with funds allotted by Congress.
>
> They have mobilized more than 10,000 city and rural schools to give defense training.
>
> They have mobilized 142 colleges of engineering to give short-course training to more than 110,000 engineers.
>
> They have adopted in more than 500 communities the motto, "We never close," in order to use vocational school equipment 24 hours a day.
>
> They have given training to half of all the workers hired by expanding aircraft industries.
>
> They have helped more than 50,000 WPA workers to leave relief rolls and enter defense industries.
>
> They have provided vocational defense training at the low average of 21 cents per man-hour.
>
> They have operated this program at an overhead cost to the federal government of approximately one percent.

With the Nation unified, this record can be and is being surpassed today!

Without doubt, school shops and shop teachers will be called upon in greater numbers and degree to aid in carrying forward the program which will lead to victory.

Demands will be made on teachers and equipment—some of them not consistent with what teachers consider legitimate educational purposes. Nevertheless, it is absolutely essential that we unite in the all-out effort to successfully prosecute the war. Teachers and school officials have willingly worked long hours and made available shop equipment in the defense-training program. This effort will be yet redoubled!

While prediction is always hazardous, it may be assumed that overnight changes will probably occur in the educational field. Toes will be trod upon as local, state, and federal agencies converge on the schools in the training program for workers in war industries. Increased federal participation is to be expected. Regardless of how local school authorities may feel about their rights and prerogatives, full cooperation should be extended. We must unite in the war effort.

Increased enrolments in shop courses, both in industrial arts and trade education, with a lack of qualified teachers, will bring problems to nearly every school system.

Demands for short courses for workers in war industries will disrupt the normal curriculum by using teaching time and physical facilities now devoted to regular shop classes.

There may even be occasional requests for the use of school facilities for production purposes, although no need for such a drastic move has been indicated as yet.

In short, trying days are ahead.

The time has come for unity of purpose. Our first responsibility is to our country and our second is to the pupils in our schools. These two responsibilities in most instances will be synonymous because the youth of our Nation are its strength.

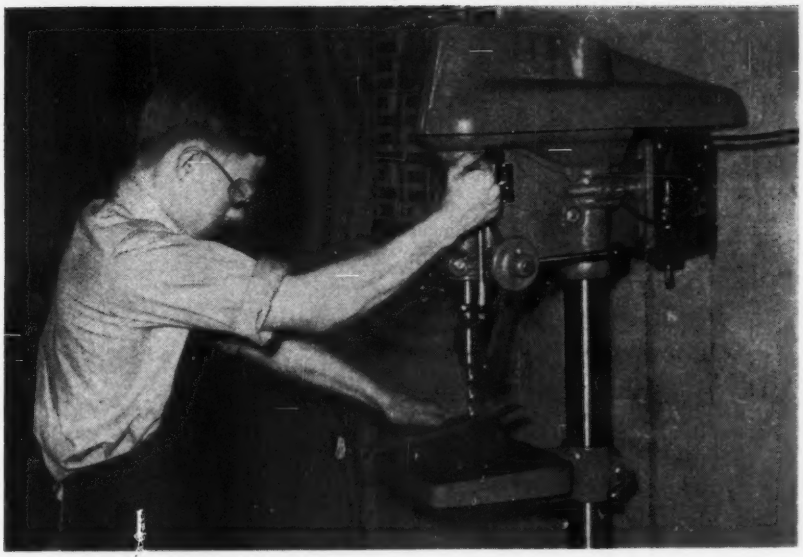
This war indicates in no small voice that this is an industrial though by no means completely civilized world.

The importance of industrial arts and of trade and industrial education in the total educational picture is being brought home as never before. Our position may suffer temporary dislocations but after and even during the long haul the importance of industrial education in its broadest sense will be accented in the schools of today and tomorrow.

Safety in the School Shop

by G. C. Cook

As teachers are liable for their own negligence although acting as agents for the state, it is important that they be able to demonstrate that reasonable precautions have been taken should an accident occur and suit be filed. The shop teacher who uses reasonable caution should have no cause for worry, but negligence on the part of the teacher may have disastrous results. This article points out many ways to take reasonable precautions. G. C. Cook is a member of the staff of the U. S. Office of Education working on the National Defense Vocational Training Program.



Small pieces should be clamped securely in place when drilling. Delbert Anderson is the student working in the shop of the St. Johns, Michigan, High School where Sherwood Spreiter is the instructor.

SCHOOL administrators, teachers, parents, and students must have an appreciation of the need for a comprehensive safety program in connection with school shop activities. Safety should be thought of as an integral part of the shop program and not something merely attached to it. In some schools this important aspect of the program has not received proper emphasis. This may be due to the fact that in these shops few serious accidents have occurred. School officials, however, must be cognizant of the need for proper safety measures and not wait for a serious accident to occur before becoming aware of the importance of effective safety in the shop. A student may lose an eye, man's most priceless gift, simply because he did not wear goggles while grinding a piece of stock, or he may lose a finger because he did not use a guard while sawing with a circular saw. This is an expensive way to learn the need of safety in the school shop. *It is the responsibility of the school to provide a safe place for students to work.*

Use of Visual Aids

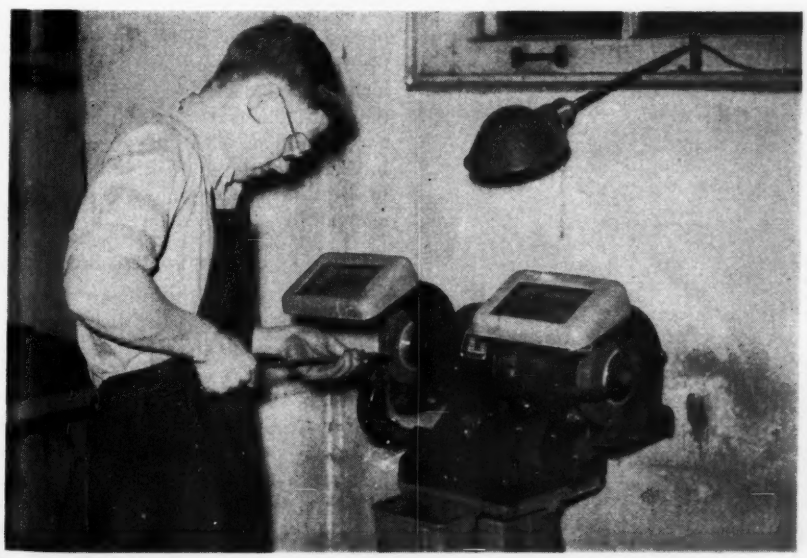
It is the responsibility of the teacher to develop in the student appreciation of and desirable attitudes toward safety in the shop. One of the most effective ways of doing this is through the use of visual aids such as films, slides, and posters. There are a number of valuable posters available which should be properly displayed in the shop. Likewise, there are a number of desirable slidefilms on safety which can be purchased and others may be borrowed from commercial concerns. Some teachers have taken pictures of recommended safety procedures and made slides to use in connection with their shop classes. The writer has used this method and found it to be very desirable.

Teachers in planning their courses in shop should outline objectives involving fundamental safety measures. They should also outline ways and means of accomplishing these objectives. A sympathetic and intelligent attitude is needed on the part of the teacher. Likewise, judgment and "common sense" are exceedingly important traits of a shop teacher which should be reflected through his ability to plan an effective program of safety in the school shop.

Some general safety measures which may be provided in the plan are as follows:

1. Hold discussions with students on safety in the shop.
2. See that the shop is properly lighted and ventilated.
3. See that all equipment is properly placed and sufficient space provided around it.
4. See that the shop is kept clean and properly organized.
5. See that all students are properly dressed for the jobs to be done.
6. When students work around machinery in operation, see that sleeves are rolled up; neckties, rings, and wrist watches removed; and hair properly combed back.

The sleeves should be rolled up, necktie removed, and the eyes protected as illustrated by Delbert Anderson at the grinder.



7. Do not permit students to scuffle in the shop.

8. Avoid crowding around machinery in operation.

9. See that necessary safeguards are used on all pieces of machinery.

10. See that tools are in proper condition.

11. See that students use equipment properly—*few accidents occur where tools and equipment are used correctly.*

12. See that first-aid supplies are on hand.

13. Treat all injuries immediately.

14. See that rags which become saturated with stain, paint, or oil are placed in metal containers and burned at the close of the day.

15. Display posters on safety in convenient places.

16. See that goggles are worn when chipping or grinding.

17. See that machines are shut off before making adjustment.

18. Have a safe place for everything and keep it in its place.

19. Keep fire extinguishers conveniently located in the shop.

20. Keep gasoline and other volatile liquids in safety-type cans.

21. Do not permit "fooling around" in the shop.

22. See that students do not lift heavy objects by themselves.

23. See that all electrical equipment is properly grounded and that there are no exposed wires.

24. Do not attempt to repair electrical appliances that are "hot."

25. See that proper tools are used for the job to be done.

26. Do not permit stock to be drilled unless it is properly held in place.

27. Use care when sliding the hands along boards that may have slivers.

28. Secure a series of slidefilms on safety to show the class.

All accidents should be taken care of immediately as in the school shop at Mason, Michigan, where instructor Ervin Holtforth is shown dressing a minor wound.

Good Housekeeping Essential

It is extremely important that the shop be kept neat and in good order at all times. A definite part of the training program in the shop should be the development within the students of desirable habit formations, one of which is to keep the shop clean and everything in its place. Numerous accidents may occur in a shop which is not kept clean and properly organized.

Any oil that is spilled on the floor should be cleaned up immediately to prevent slipping. Blocks of wood, tools, and pieces of material with nails turned upward should be kept off the floor. Likewise, any pieces of hot iron from the forge should be removed from the path of students. In other words, any materials lying on the floor which may prove hazardous to the safety of the students should be immediately removed. All aisles should be kept clean and free of all equipment that might cause someone to fall. Lumber, iron, and other supplies should be securely held in stock racks to avoid any danger from falling. All storage facilities must be kept neat, clean, and properly organized. "*Accidents do not just happen—they are caused.*"

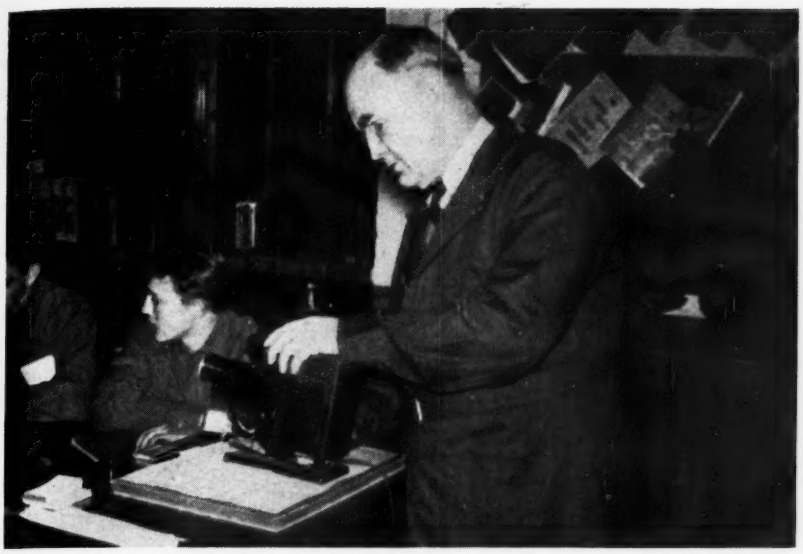
The shop teacher should work out a system with the students for cleaning the shop at the close of the period. (See page 22, October, 1941, SCHOOL SHOP for such a plan.—*Editor.*) This should include a student designated to check the tools, others to clean the benches, sweep the floor, clean the sink, pile the lumber and store other supplies, put projects in place, remove all "junk," and the like.

Use a short piece of wood to push boards the last six or eight inches to the saw blade when ripping as does Delbert Anderson of St. Johns, Michigan.

Use Tools and Equipment Properly

The selection of the proper tool for the job to be done is exceedingly important. Likewise, the correct procedure in using tools is essential for effective results in safety control. Following are a few general suggestions on the use of tools and equipment worthy of consideration:

1. Avoid using chisels, punches, and hammers with mushroomed heads.



Showing slides on safety practices in the Pontiac, Michigan, Vocational School, an important teaching technique.

2. Avoid using tools with loose, broken, or splintered handles.

3. Select wrenches of the proper size and ones that are not worn.

4. When using a wood chisel, avoid holding the work with one hand and pushing the chisel toward it with the other.

5. Wear a respirator when operating a paint spray gun.

6. Keep hands away from a power saw when it is running.

7. Use a short piece of wood, eight to ten inches long, to push narrow boards the last six or eight inches to the saw when ripping.

8. When filling a blow torch, avoid spilling gasoline. If any is spilled, wipe it off before lighting the torch.

9. Set the torch in a position that will direct the flame away from combustible material.

10. Place hot soldering coppers in metal racks or holders.

11. Do not leave the chuck wrench in the chuck of the drill.

12. Keep tool rests properly adjusted.

13. Do not be in a hurry—*be careful.*

The teacher must practice safety measures if he expects the students to use the correct safety precautions. It is his responsibility to give frequent demonstrations on the use of tools and equipment. He should observe the students at work to see that they are following the procedures as demonstrated and that safety precautions are not violated. Some teachers have found it desirable to appoint one student as a "safety" foreman to check the safety measures used, and also, to see that all equipment is used properly by the students. Other teachers have found a check sheet to be desirable as one method to use in evaluating the effectiveness of safety measures.

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4. *Industrial Safety Education in Schools*, Metropolitan Life Insurance Company, School Health Mono., No. 10.

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6. Smith, J. Warren, *Safety Education in North Carolina Schools*, N. C. Division of Teacher Training, Industrial Education Series, Bul. 2, 1939.

● A RECENT study of shop accidents in the New York City schools disclosed a most remarkable record. During the fall term of 1939, 262,132 pupils received shop instruction for periods ranging from 45 minutes to 15 hours per week. Yet only 363 accidents occurred during this time.

Moreover, many of the accidents recorded included such minor injuries as splinters and cuts from hand tools and materials.

Maximilian Komow of the New York City schools administrative staff says, "A great deal of misconception exists regarding the nature of accidents in school shops. According to the general impression, the majority of school shop accidents are ascribable to the use of power machinery. This impression is erroneous. There are some people who, because of this misconception, would eliminate much of the necessary machinery now found in our shops. The analysis of shop accidents occurring during the fall term of 1939 disclosed some interesting information on this subject. Of the 363 accidents reported during that period, only 36, or 10 percent, resulted from the use of power machinery; falling objects and cuts from hand tools and materials are to be held accountable for the remainder of the accidents."

In 1932, formal regulations regarding safety measures were put into effect in New York City school shops. They have since been revised several times. The efficient enforcement of these rules is primarily responsible for the excellent safety record in the opinion of Mr. Komow.

He states that there are a number of conditions which are conducive to accidents, the most important of which are overcrowding, lack of proper safety instruction, failure of pupils to obey instructions, lack of proper safeguards, and improper working conditions. The elimination of these factors will prevent accidents, he contends. Overcrowding is the most serious individual factor, he says, and recommends that no teacher be responsible for more than 25 pupils at once.

Good housekeeping is an important factor in maintaining a good safety record. Delbert Anderson wields the brush in the St. Johns, Michigan, school shop.

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A Streamlined Approach *to* Drafting

• *by* AUGUST FLAM

This unorthodox approach to the teaching of drafting is unusual but has shown results, says Author Flam, Head of the Industrial Arts Department, John Marshall High School, Los Angeles, Calif.

THE usual drafting course starts with orthographic projection. This procedure is more traditional than logical. In education we usually begin with the simple, and advance toward the more involved and complicated. It should be so in the teaching of drafting. In its essentials, isometric projection is simpler than orthographic, and inasmuch as it contains a pictorial element which orthographic projection does not have, it is closer to the learner's past experience and therefore seems to have a greater appeal. Experiment has revealed that isometric projection is easier for the pupil to comprehend, and certainly much easier for the teacher to make interesting than orthographic. It should be obvious that once the teacher captures the interest of the class, half of his difficulties vanish. The teaching of orthographic to beginners has often resulted in discouragement and consequent loss of interest, and therefore the approach via isometric merits at least a fair tryout.

A set of simple rules under three different headings can be dictated to the class on different days, and amplified with numerous blackboard illustrations. The textbook, if there is one, should not be used. It is surprising how much more readily pupils grasp a dynamic blackboard explanation than the printed page. Usually the pupil's attention is followed by interest, which can turn into enthusiasm if properly directed.

Here is the presentation:

Part I. Isometric Axes and Isometric Lines.

A. Isometric projection is a form of picture drawing based on a framework of three axes, thus:

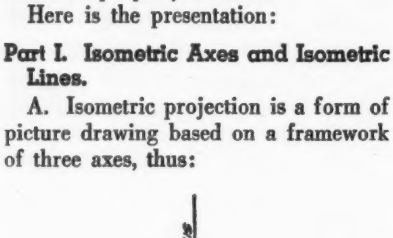


FIG. 1.

B. Lines which are parallel to the isometric axes are called isometric lines.

C. Measurements may be taken on the isometric axes and on isometric lines *only*.

D. The first step in the drawing of any object in isometric projection is to construct the three isometric axes—as shown in Fig. 1. Then proceed as indicated in Fig. 2.

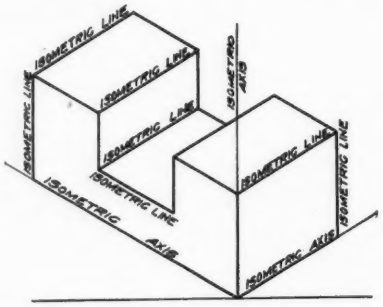
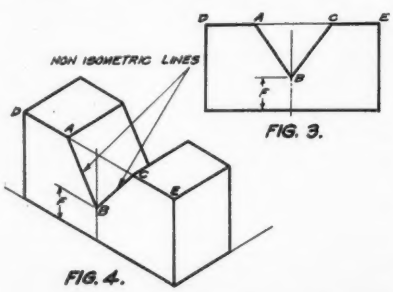


FIG. 2.

Part II. Non-Isometric Lines and Angles.

A. A line which is not parallel to any one of the isometric axes is called a non-isometric line.

B. Measurements may not be taken on non-isometric lines, but such lines can be found by locating the two extremities and connecting them by means of a straight line. See illustration below.



A, *B*, and *C* are the ends of the non-isometric lines.

AB and *BC*, found in Fig. 3, and transferred to Fig. 4.

Hence Fig. 3 indicates that sometimes an orthographic view must be constructed to locate extremities of lines.

C. An angle in isometric projection does not appear in its true size. It is first constructed in its true size and then transferred to the isometric figure as indicated below in Fig. 5 and 6.

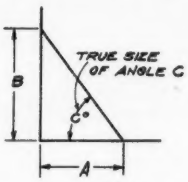


FIG. 5.

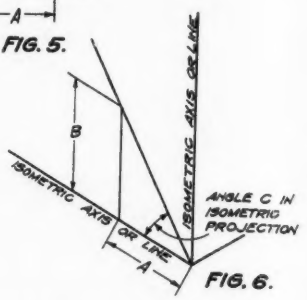


FIG. 6.

Isometric lines *A* and *B* are measured on Fig. 5 and transferred to Fig. 6.

Part III. Circles and Arcs in Isometric Projection.

A. Before an isometric circle can be drawn, an isometric square should be constructed whose sides must be equal in length to the diameter of the isometric circle required.

B. This isometric square will have two large and two small angles. The vertices of the large angles are used as centers of arcs, drawn tangent to the sides of the square, which form part of the isometric circle. See Fig. 7 below.

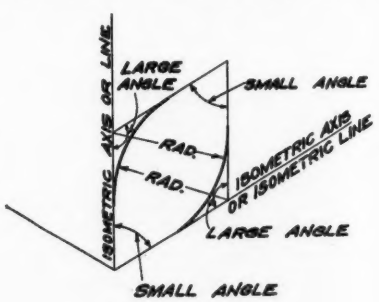


FIG. 7.

C. From the vertices of the large angles drop perpendiculars to the two opposite sides. These perpendiculars intersect in two points— x and y—which are used as centers of smaller arcs than those drawn in Fig. 7, and complete the isometric circle. See Fig. 8.

CD and *CF* are perpendicular to *AO* and *AB*, sides of the isometric square which are opposite the large angle *C*.

AE and *AG* are perpendicular to *CB* and *CO*, sides of the isometric square which are opposite the large angle *A*.

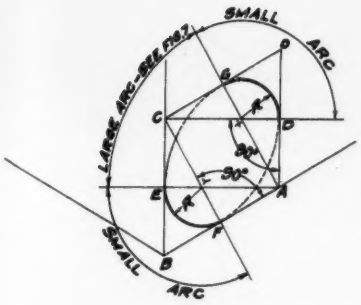


FIG. 8.

D. Half circles in isometric projection are constructed by the use of isometric squares. See Fig. 9.

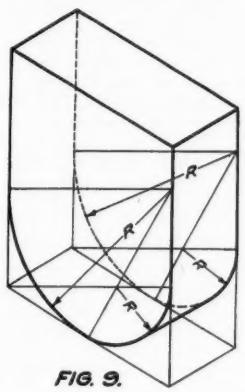


FIG. 9.

E. Quarter circles for rounded corners are constructed by measuring the actual radius from the corner and drawing perpendiculars which, at their point of intersection, locate the center of the circular arc then used as the radius for the corner. See Fig. 10.

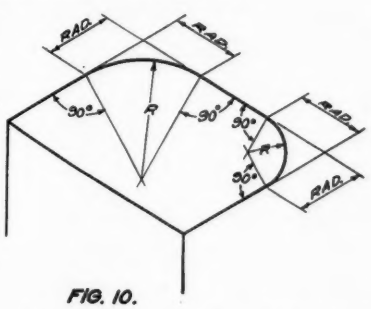


FIG. 10.

Aside from the pedagogical aspect, this type of projection has other obvious advantages:

1. It enables one who is not talented in freehand drawing to construct comprehensive and passable pictures of simple objects—either freehand or with instruments.

2. It is a form of pictorial drawing which is readily comprehended by those not able to interpret views in orthographic projection.

3. In some cases economy in drafting results, as all the dimensions can be placed on a single view.

After this simple presentation of isometric projection, the suggestion is that a short period be spent on lettering. It is well to use the easiest type and concentrate on that type alone. Attempting to teach capitals and small letters at the same time is bound to result in disappointment and failure. Recent studies indicate that 84 percent of approximately 150 manufacturers throughout the United States, producing more than 65 different products, use slanting capitals only.* It would thus be quite safe to teach that type. Further, if each letter is explained to the class separately and illustrated on the blackboard while the student observes how it is made and has a chance to ask questions, the results will be far more satisfactory than if he is given a chart or a book to copy from. Also not more than five or six of each letter and number should be required from students. It need hardly be pointed out that endless practice results in loss of interest, and poorer work at the end of the practice period than at the beginning. All the essential lettering practice can be done in one week or less.

Having now captured the pupil's interest via isometric projection, and having equipped him with some knowledge of lettering, he is adequately prepared for orthographic projection. Instead of using new material for problems and for purposes of illustration, the identical figures which were previously drawn in isometric and with which the class is now familiar, should be drawn in orthographic. After the general principles are understood, every figure should constitute a problem. In other words, if the teacher aids the class in drawing the front view and possibly suggests the location of the top and end views, the class should then proceed to complete the figure. Or if this should be too difficult, then the three views may be drawn by the instructor on the blackboard, with some of the important lines omitted, or with dotted lines left off, or a combination of both, so that something may be left as a problem. No work can have vitality if it is only a copy job.

Following the above procedure, we go from the familiar—the picture drawing—to the unknown—the flat plane projection. As the usual procedure is to begin the drafting course with orthographic projection, when the class goes on later into isometric, the invariable comment of members of the class is that isometric is very easy. This seems to indicate that isometric projection presents less difficulties both to the class and the teacher in a beginning drafting course.

*A Survey of Lettering, by the A. Lietz Company, San Francisco.

Non-Skid Shop Floors

by **FRANCIS R. SCHERER**

Superintendent of School Buildings, Rochester, N.Y.

FINISH flooring in new shops can be selected from several satisfactory materials but floors in existing shops and in instructional rooms converted into use as shops are apt to be of some such material as strip maple. In woodworking, the sawdust falling on such floors creates a slippery condition in which the hazards are greatly increased by reason of the moving parts of machines and the sharp cutting edges.

We had several such conditions in our schools and, after considerable experimentation, found that they could be greatly improved by painting the floor area in the vicinity of the machines with an abrasive surface paint.

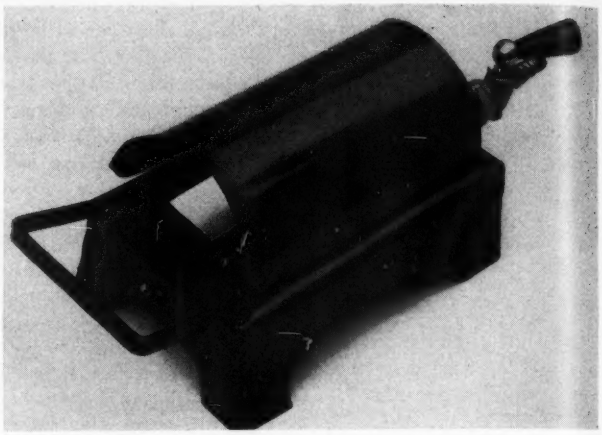
While there may be several of these abrasive paints on the market, only two of them have come to our notice. We have successfully used such a paint made by the Garland Company of Cleveland, Ohio, and another made by the American Abrasive Metals Company of Irvington, N.J. These can be satisfactorily applied by the school custodian.

Some school systems secure a non-skid area around dangerous machines by the use of corrugated matting bound with brass strips. These strips constitute in many cases a stumbling hazard which, of course, is not true of abrasive paint.

Project of the Month:

Building a Soldering Furnace

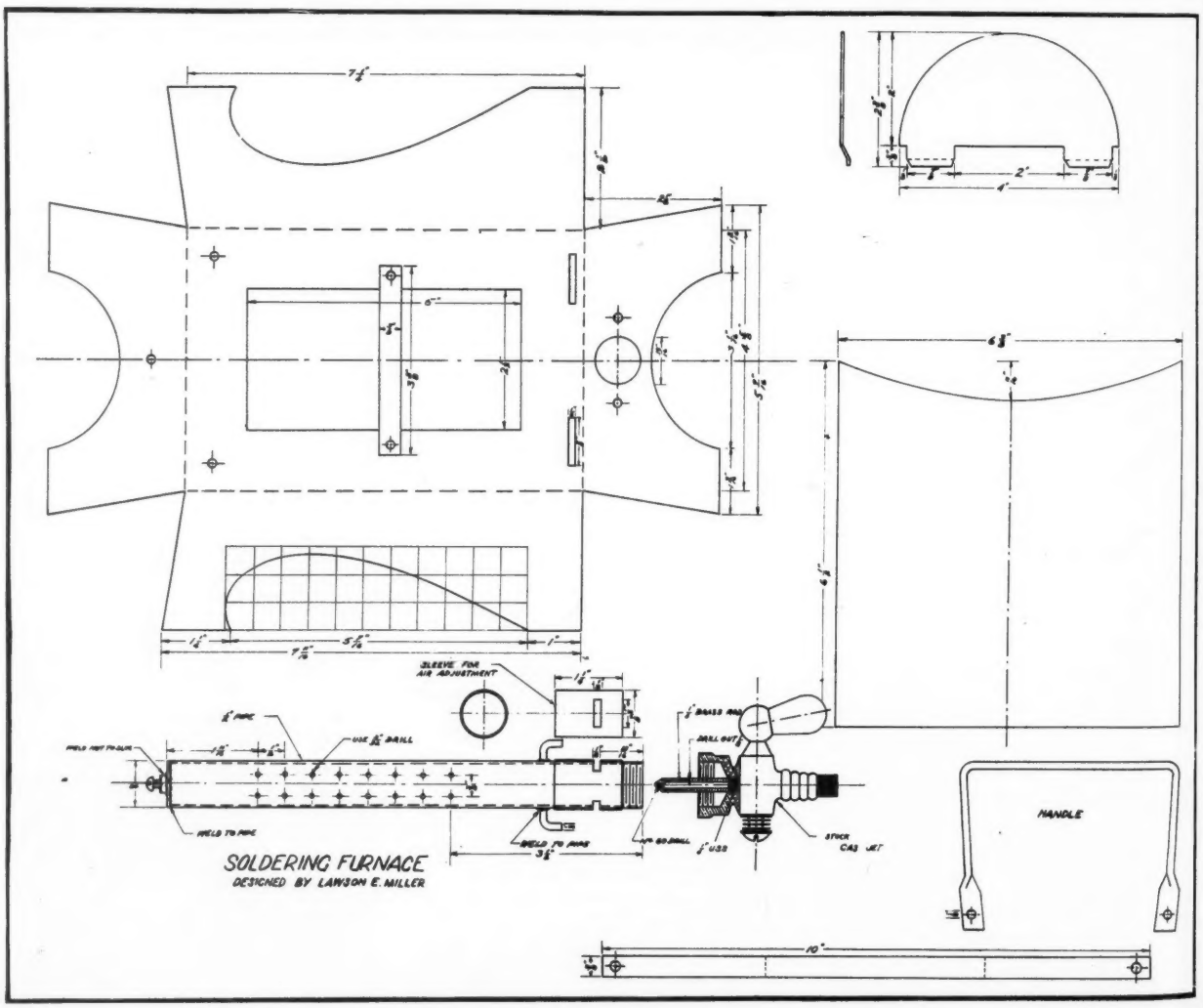
• *by* LAWSON E. MILLER

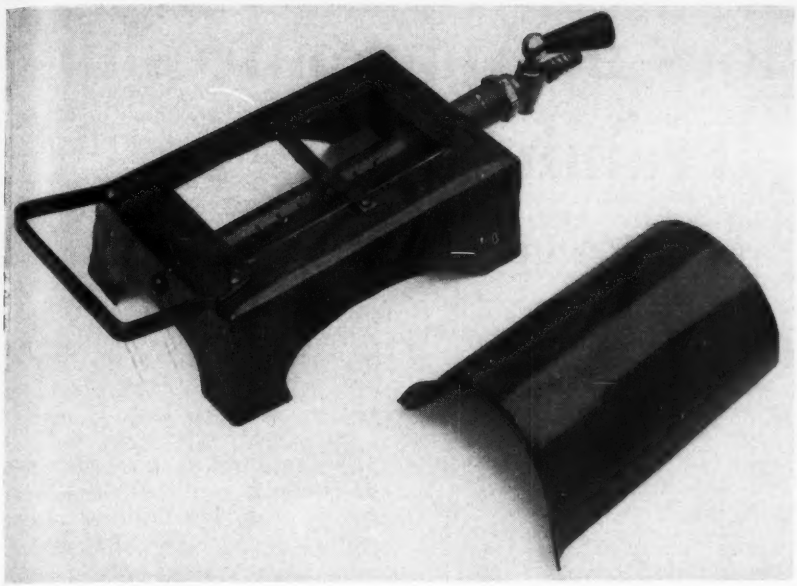


High utility and low cost feature this month's project, which may in turn become a part of the student's home-shop equipment. Lawson E. Miller teaches metalworking at Eagle Rock High School at Los Angeles, Calif.

SINCERE student interest is recognized as the one greatest influence behind good school shop atmosphere. Any student will tell his instructor that he is most interested in making something he can use, usually in his home shop. It was with this thought in mind that we designed the home-shop soldering furnace. It is an extremely popular project and easily within the capacity of the boy in his second semester of metal work. Added attractions of the furnace are its low cost and utility. Including the purchased gas valve, the total cost seldom runs over 75 cents.

The flat layout is rather simple and self-explanatory. The center and irregular edges of the base are shear-cut in a machinist's vise by the use of a cold chisel. Edges can then be dressed smooth with a file. This lower section of the furnace can be formed in a folding brake and finished on stakes. All





corners are welded with a No. 1 tip and should be well enough formed so that the addition of welding rod is unnecessary. The welding operation is splendid experience for the amateur welder.

To fabricate the hood, the end is first cut to shape and the curved part rolled to fit. Forming rolls will shape the hood. (Caution: Keep the metal square in the rolls to prevent warping.) Use the same welding technique in welding the cover together as the base. To fit the cover to the base, slots are cut as shown in the layout. This may easily be accomplished by drilling a series of holes and filing out. Be sure to "joggle" the ears so the hood will stand upright on end when lifted. This will prove a convenience when lighting the furnace or heating over it. The appearance may be greatly improved if the edge at the open end of the hood is slightly rolled up. This can be formed with a ball pein hammer over a wooden block.

The burner is the heart of the furnace and can be simply made from a piece of black iron pipe. Holes are laid out and drilled as shown in the drawing. The apertures shown are for natural gas. Artificial gas would require smaller openings. One end is threaded with the standard ½" pipe die. The opposite end is closed by the use of a slug to which a nut has been welded. This supports the blind end of the burner in the furnace base. Right-angle ears are made from one-eighth welding rod and welded to the side of the pipe as shown. When the burner is assembled in place, these ears hold the pipe with the row of holes upright.

Slots near the threaded end form a simplified air mixing valve. The covering sleeve with matching vents is free to turn so the air intake may be altered for effective flame adjustment.

The one-half inch gas cock can be purchased in any hardware or appliance store. In most cases the center hole is the right size for a ¼" USS (NC) tap. If not the right size, drill with a No. 7 wire gauge drill into the center, being careful not to damage the taper valve seat. It may then be tapped to the ¼" size. The orifice or "jet" is a section of ¼" round brass rod step drilled as shown. It is important that the jet reach *slightly past the slots* on the inside of the pipe, as this assists in the mixing of the gas and air.

The job is now ready for final assembly except for the "rest" which is cold formed in a vise and riveted in place as shown. The final assembly and testing of the completed job is a period of the keenest enthusiasm. The boy has had experience in layout, cutting irregular shapes, forming, welding, drilling, tap-and-die work, and the science of gas burner design.

MATERIAL LIST:

1 pc.	12" x 20"	Black sheet steel (14 or 16 ga.)
1 pc.	9½" length	Black iron pipe (½ in.)
1 pc.	14" length	Band iron (⅛" x ⅜")
1 pc.	2" length	Welding Rod or Wire (⅛" dia.)
1 pc.	2" length	Brass rod (¼" round)
1	10-24	Machine Screw (iron) (¼" length)
1	10-24	Nut (iron)
1	½"	Gas Service Valve
4	⅛" x ¼"	Rivets (round head soft iron)

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Success Factors in Apprenticeship Training

by M. Reed Bass

Factor One—The Employer

THE employer is probably the most important single factor in an apprenticeship training program. He can bring success or failure to the plan. If the employer is not truly interested in training apprentices, the program is doomed to failure.

Too frequently the employer will spend thousands of dollars to keep machinery in repair, to replace worn-out tools, and to purchase expensive devices to speed up production, and then forget about replenishing the working force.

Specialization has done much to reduce the number of all-round thoroughly competent mechanics in practically every field. The old expert mechanics are rapidly passing out of the picture and there are only a few new ones being prepared to take their places.

Too often when a representative of a vocational school approaches Mr. Employer in an effort to interest him in an apprenticeship training program, the employer resists or is too busy to listen. The reverse should be true. The employer should seek the services of the school, particularly since the school is willing to provide the training at no cost to the employer. With the increasing shortage of skilled workers in practically every line of work, it is no longer an easy matter for one employer to get his skilled help from another employer.

There are, of course, a number of employers who have had the foresight to anticipate the shortage of skilled workers and have set up plans by which skilled mechanics are trained. Some of the organized crafts or unions have for many years sponsored training programs, either through evening schools or correspondence study.

An organized training program enables an employer to determine accurately the cost of training skilled workers. Without an organized program, the cost of breaking in new workers is hidden.

The cost to an employer includes such items as the time of supervisors, foremen, and journeymen; spoiled work; and broken machinery. It is obvious that the employer has an economic interest in the training of apprentices.

If the employer and his force do not understand the major objectives of the apprenticeship plan and if the training agency does not have the full support of all concerned, the program can be expected to fail.

Factor Two—The Training Agency

The training agency is the second most important factor in apprentice training. The training agency needs to know what *skill* and *knowledge* should be taught and what methods and devices are best for teaching trade subjects.

Efficiency is as much to be expected from the training agency as from the employer who is a specialist in production. When an employer displays interest and is willing to give support to the program and the training agency *knows what to do and how to do it,* an effective program can be created.

Factor Three—Selection

Apprentices should be carefully selected. Only those should be accepted who can meet definite standards. Qualifications for entrance should be drawn up with minimums and maximums of performance.

An analysis of the trade or craft should be made. Every payroll job has its own set of standards and qualifications including such items as physical fitness, height, weight, appearance, personality, education, interest, and special aptitudes. These standards should be worked out by the employer in cooperation with the training agency.

Some employers hire graduates from vocational schools as advanced apprentices. These young men have demonstrated their earnestness by completing a two- to four-year course and rarely fail in their apprenticeship program. Many employers credit apprentices, year for year, for the time spent in a vocational school.

In case other selective devices fail, a probationary period of not more than six months is usually provided, at the end of which time those not making satisfactory progress are eliminated.

Factor Four—Work Schedule

A schedule should be prepared for the entire training program so that a well-rounded and all-inclusive course may be given. The program should include: the period of apprenticeship in years, months, and hours; the number of hours to be spent in shop practice in each department; the machines, tools, or other devices the apprentice is to learn to operate, together with the time he is to spend on each; length of classroom hours and division of time devoted to each related subject; rate of pay at the various stages of the program; and the working conditions. The schedule is of vital importance in selecting the teaching content for the course.

A contract or indenture approved by state or local advisory committees serves to indicate to apprentice, employer, and training agency what obligation each has in the program.

Factor Five—Teaching Content

The teaching content provided by the training agency can be determined only after the payroll jobs and the work jobs have been analyzed to find out *what the worker does* and *what he needs to know.*

The worker needs to know such things as: shop knowledge or what are commonly known as "tricks of the trade"; the mathematics needed on the job; a knowledge of materials; the scientific facts used on the job; how to read blueprints; how to lay out work; how to practice safety; how to prevent waste of time and materials; and how to protect machinery against abuse and wear. Information about the company should be given, including such things as what it is, what it does, how it operates, who its customers are, how much tax it pays, and what some of its problems are. The

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Check your apprenticeship training program against this list of factors to find out wherein you may make improvements. If you are considering the introduction of an apprenticeship program, here are some points to keep in mind. M. Reed Bass is Director of the David Ranken, Jr., School of Mechanical Trades, St. Louis, Missouri, and a member of the Editorial Advisory Board of SCHOOL SHOP.

foregoing information should be given to the apprentice as part of his training, rather than allowing him to get it in a distorted form from persons not employees of the company whose motives may not be above reproach.

Factor Six—Evening School

The evening trade extension school is frequently overlooked when apprenticeship training programs are organized. Yet the evening schools, in the larger communities at least, have the equipment to provide the fundamental training on many of the machines which the apprentice may fail to have the opportunity of operating on the job. The apprentice may also learn how to do a large number of things in the evening school which he is unable to learn in the shop of the employer because production schedules too often allow only limited practice.

The combination type of program, including training on the shop floor by the company, vocational school part-time related subjects instruction, and the vocational evening school shop instruction, has been used successfully for many years in Minneapolis and St. Paul by four of the railroads operating repair shops in these cities. This method is a profitable plan for the employer, even if he is compelled to pay the apprentice for time spent in evening classes.

Factor Seven—Coordination

Much talked about but seldom really accomplished is *coordination* of the apprentice training program. Coordination is the tying together of all phases of the training and keeping the program running smoothly. There is a great deal of "smooth running," but little "tying up."

In programs where the employer conducts the shop training and the public or private school provides the training in the related subjects, the apprentices are frequently assigned to a class conducted for regular high-school students. The course content is general, and little if any specific application is made to problems of the trade. It is this type of coordination and teaching which breaks down an apprentice training program and puts part-time education to shame. Only through the teaching of functioning facts and ideas and presenting them at the right time can the training be of the greatest value to the apprentice and the employer.

The related class instructor should make frequent trips to the shops in which the apprentices are working. The coordinator and instructors should hold conferences with officials, apprentices, and employees with reference to the training. Meetings with shop committees, advisory committees, and the like should be arranged. It is only through "tying up" the program with all of these agencies that one can expect to meet the needs of apprentices and employers.

Factor Eight—Instructors

Only those who know both the trade and the teaching content should teach apprentices. If the instructors on the shop floor are regular employees of the company, they should be assigned to the shop training job exclusively, at least while they are in charge of the apprentices. Too frequently they are given odd work jobs or wish "to keep their hand in" at their skill and forget about the apprentices. A program cannot be expected to last long under these conditions.

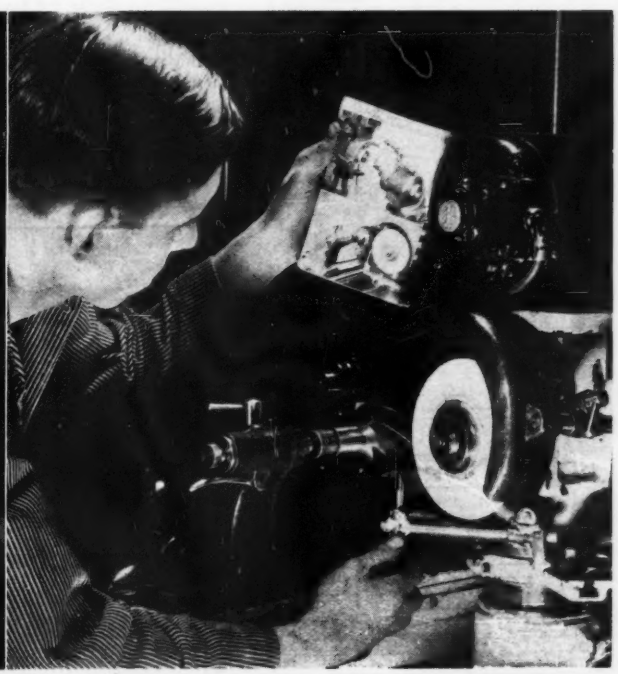
On the other hand, the average industrial arts teacher in a high school who has had only a little or no trade experience should not be expected to teach a trade subject, for obvious reasons.

The instructor of apprentices should be thoroughly trained in the methods and techniques of training skilled workers and must thoroughly understand what the skill requirements are for a trade.

Only through a complete and well-organized training program can industry expect to maintain a competent working force, dignify labor, and serve the young men graduating from our high schools, so many of whom are at a loss today to know where to turn for assistance in the selection of, and the preparation for, a vocation.

An apprentice in an evening extension trade class rough turning a screw for a carpenter's vise, using Burghardt's "Machine Tool Operation" as a guide.

An illustrated operator's manual issued by a tool manufacturer helps this apprentice in setting a finger for proper clearance in cutter grinding.

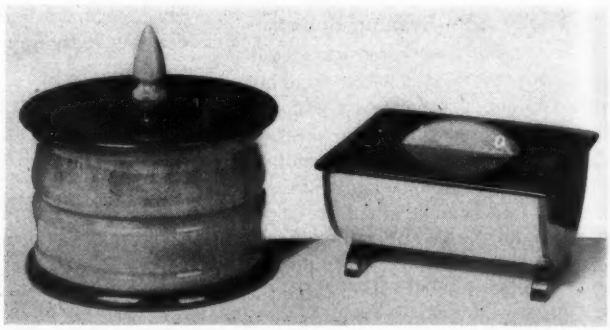


Tested Instructional Projects

—These projects have all been shop tested for school use

Two Plastic Dresser Boxes

by Earl G. Darby



Here are two well-designed projects in plastics—a medium which is gaining in popularity constantly. Earl G. Darby teaches in the Shop Practice Department of Kansas State College, Manhattan.

IF you are looking for simple, attractive plastic projects which will appeal to shop students on the secondary school level, select a dresser box to be used for jewelry or other odds and ends found on a dresser. A turned dresser box will involve nearly all the processes encountered in working plastics.

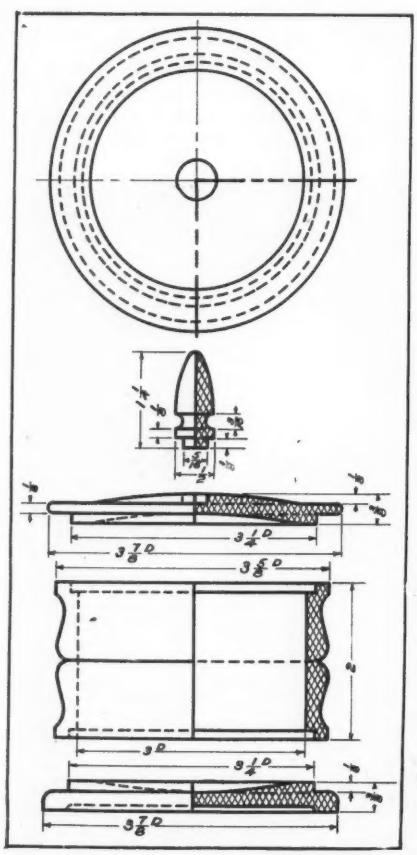
Plastics are worked with ordinary woodworking tools and machines, the various operations being the same as if hardwood was being used in the construction, except that in turning, a scraping cut is better than a skew cut.

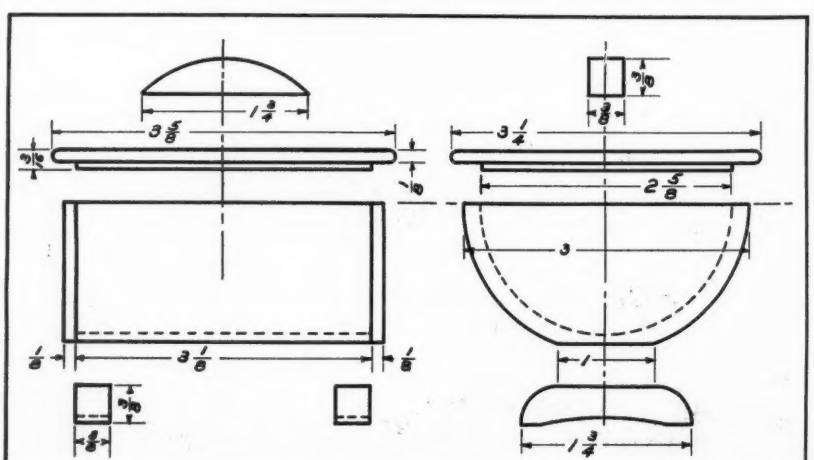
Various harmonious color combinations may be used to make colorful attractive boxes. In the turned box, the body and handle may be of mottled turquoise blue and the lid and bottom of plain wine. In the half round box, the center portion of the body and the handle may be of cloudy ivory with the lid, end sections, and feet of cloudy amber.

In making the turned box, the body section is chucked in a three or four jaw chuck or placed on a tightly fitting wooden cylinder suspended between centers. The outside surface of the cylinder is shaped to the desired shape after which the ends are squared and the recesses cut for fitting the lid and bottom. For the lid and bottom cut on the jig or band saw two circles from sheet material. Chuck the piece for the bottom and shape it to the desired shape on the top side, being sure that the shoulder fits snugly into the recess in the body section. Cement the body section to the bottom by means of a special plastic adhesive. After the cement is hard, the body section is chucked and the under side of the bottom shaped to the desired shape. The under side of the lid is shaped in the chuck, again being sure of a snug fit so that the top side of the lid may be worked in the lathe while held in contact with the body of the box. For the handle, a rod is chucked and turned after which it is cemented into the hole which has been drilled in the lid. In drilling holes in plastics, the twist drill should be used. After finishing, the recess for the lid is enlarged slightly so the lid will fit loosely.

In finishing, the outside surfaces are well sanded, starting with 4-0 paper and finishing with 8-0 wet or dry paper and water. After removing all scratches and tool marks, the box is buffed on a cloth buffer using standard buffing compounds to bring out the full beauty of the plastic material.

In making the half round box, it is well to first square the ends of a cylinder in the lathe and cement the end pieces in place after which the closed cylinder is sawed lengthwise in the middle, thus making two body sections. The rest of the procedure is easily followed.





Book Display Stand

by G. B. Westerberg

The author, who teaches industrial arts in the Dundalk, Maryland, Junior High School, used this project to teach production methods.

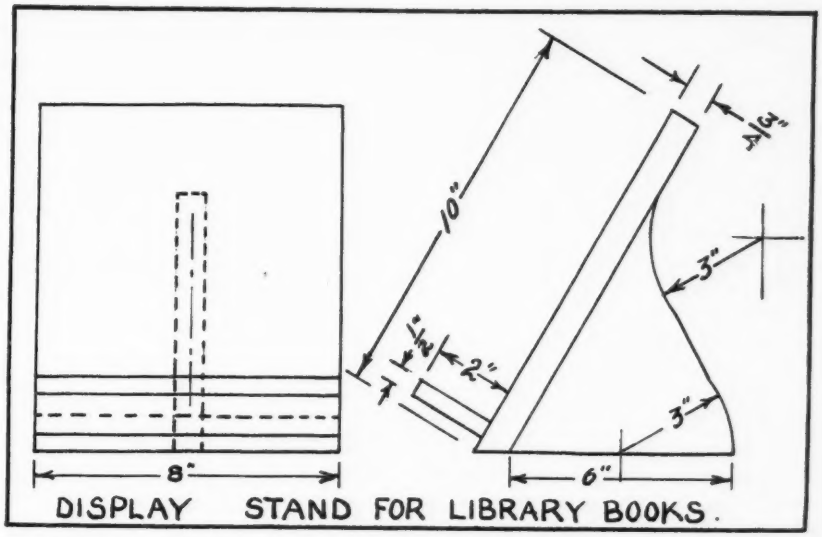
IN our junior high school general shop we do many jobs for the schools. The little book stand came to us as an order from the library.

It proved to be more than just another job to do. It gave us an opportunity to study production methods at first hand. This small project, though very simple, was set up as a production job. Each step of the production was done by a different group of boys.

Here are the various steps:

1. Lay out and cut backs.
2. Lay out and cut book rest to length.
3. Lay out and cut back to rough size.
4. Lay out curve for the support block.
5. Cut out curve for support block.
6. Lay out and cut the curve on book rest.
7. Lay out back for screw holes.
8. Drill screw holes in back (4).
9. Countersink screw holes in back.
10. Sandpaper all parts.
11. Assemble front and book rest with glue and screws.
12. Assemble front and support block.
13. Inspect for assembly flaws.
14. Touch up with sandpaper.
15. Stain.
16. Shellac.
17. Rub with pumice and polish with wax.

This little project did much to create interest and to clarify production methods to the groups involved. At a time like this, production methods and stepped up work are common expressions found in all magazines and newspapers.



DISPLAY STAND FOR LIBRARY BOOKS.

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School Shop

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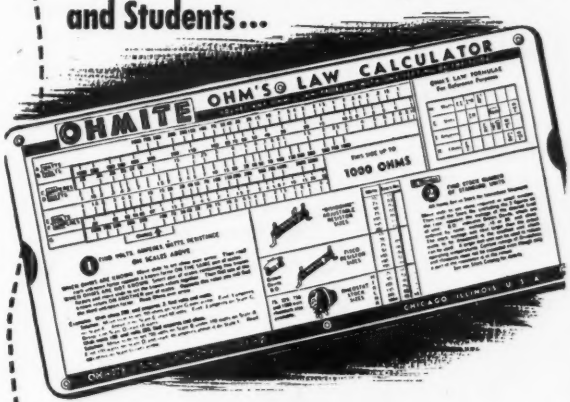

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School Shop-Jan.'42

Modern Table Lamp *from* Old Bottle

by **Homer C. Rose**

This modern, attractive project costs little, yet calls for work in wood, glass, and electrical materials. Homer C. Rose is a member of the Industrial Arts Department, Southern Illinois Normal University, Carbondale.

MODERN architecture with its functional beauty, its simple lines, and its use of glass and wood gives the suggestion for this novel lamp. As a project it is interesting because it combines manipulation of wood, glass, and electrical materials. It costs little to make and is an attractive addition to the home.

The following materials are needed:

1. Bottle—Any bottle having a pleasing surface design may be adapted to the project. The one shown here, however, is a standard bottle used by stores and can be purchased.

2. Wood—One block of hard wood 1¾" x 5" x 5". Birch, maple, cherry, mahogany, and walnut are suggested. One block of the same wood to be used for a cap to match the bottle used. (All dimensions are approximate as they should be varied to match the size and shape of the bottle used.)

3. Electrical—One socket, one 2" piece of ⅜" threaded pipe, one 6' length of lamp cord, plug, and sight-saving globe. The globe may be omitted, but one of celluloid can be purchased for 30 cents and is very desirable in a good lamp. One lamp shade to match the color and design of the lamp and to fit the globe.

PROCEDURE:

1. Square both pieces of wood to exact dimensions.

2. Locate center of base and drill slightly larger than neck of bottle.

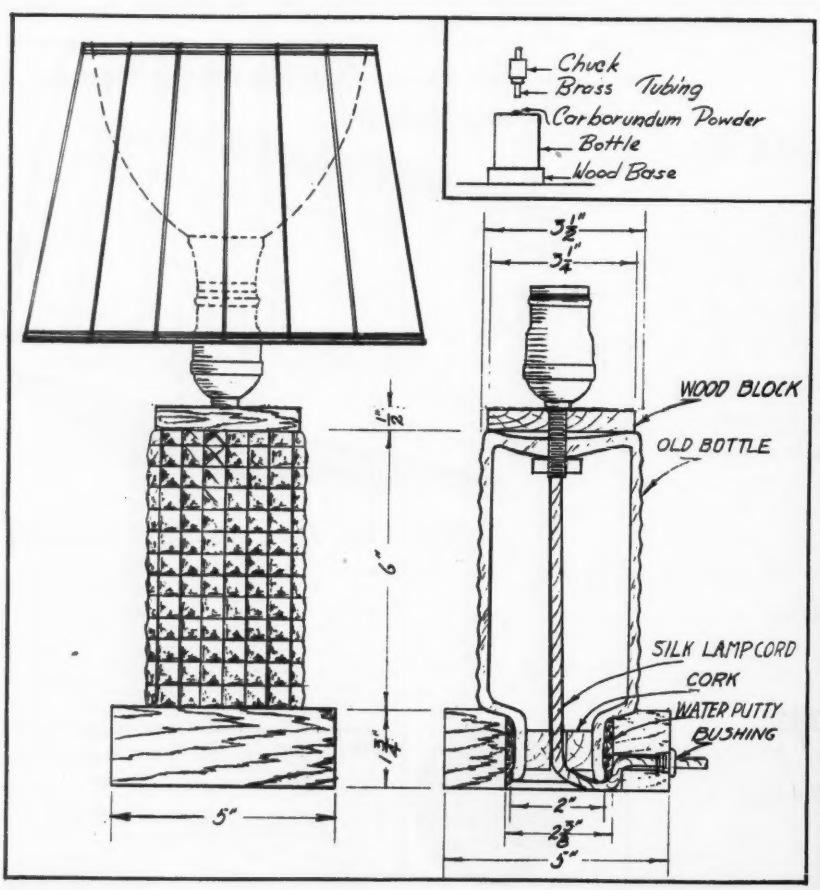
3. Round corners of wood parts to ½" radius (see photograph), and drill hole for cord and bushing. Tap hole in base for bushing.

4. Carve top of base to fit bottle. A little fresh paint on the bottle top will help locate the high spots on the wood.

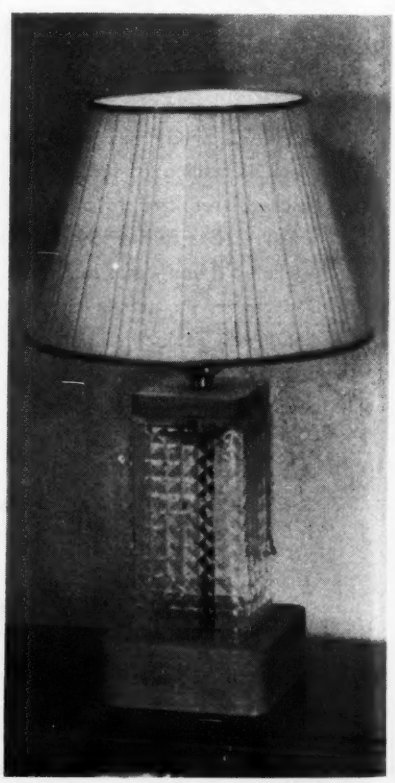
5. Place base over the neck of the

(Continued on page 18)

● **Above: the raw material.**



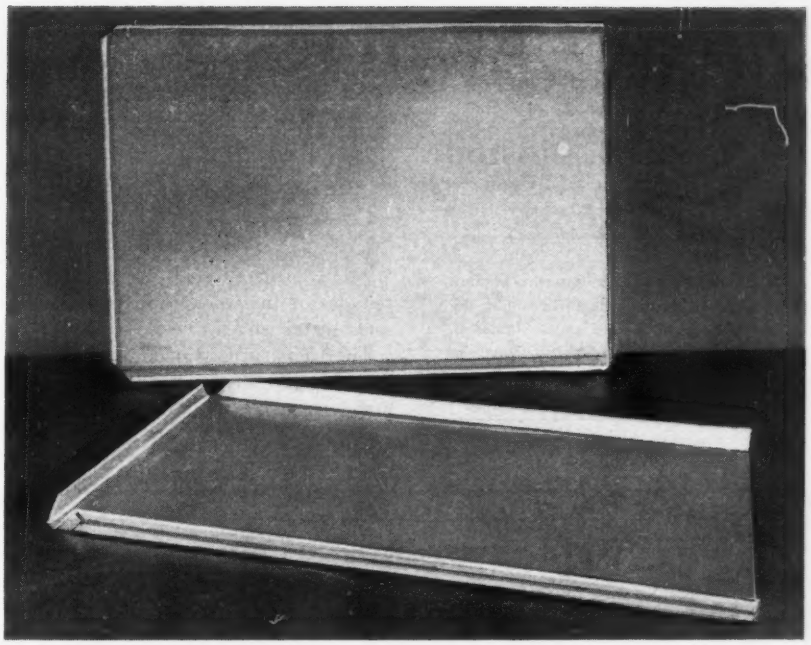
● **Below: the finished product.**



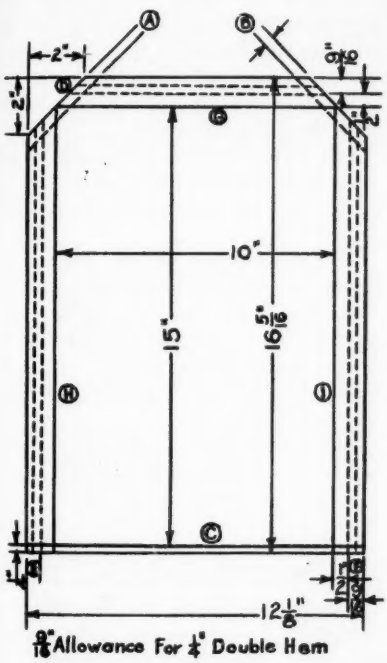
Cookie Sheet

by Einar E. Siro

Boys will take to this interesting and useful sheetmetal project—most of them should complete it in one class period. Einar E. Siro teaches shop at Folwell School, Minneapolis, Minn.



ALL boys like cookies, and one way to get them is to make mother a good cookie sheet. The illustration shows a cookie sheet that is sturdy, sanitary, safe, and easily constructed, even by the beginning student. Single and double hems on all sides make a sturdy sheet and eliminate any possibility of being cut by the edges of the metal. The open corners allow easy washing. Cookies can easily be removed by sliding them off the open end of the sheet.



The size of the sheet will depend somewhat on the size of the oven in which it is to be used. Sheets 9″ x 12″, 10″ x 15″, 12″ x 15″, and 12″ x 18″ have proved popular. The dimensions given in the drawing for construction of the sides and ends will be the same for all size sheets.

Material:

A sheet of good grade tin plate. The size will depend on the size of the cookie sheet to be made. Add 2-1/8 inches to the width and 1-5/16 inches to the length of the sheet for shaping and making the folds. Refer to the drawing.

Tools:

Ruler, scriber, tin snips or squaring shears, and a bar folder.

Procedure:

1. To layout for cutting off the corners at one end of the sheet as shown in the drawing, measure two inches from each corner along the end and side of the sheet and connect the two points with a line. Remove the two corners by cutting along these lines.
2. Set the bar folder at ¼ inch.
3. Refer to drawing. Fold a ¼-inch single hem in the same direction at *A*, *B*, and *C*.
4. Fold a ¼-inch double hem in the same direction as *A*, *B*, and *C at D*, *E*, and *F*.
5. Set the bar folder at ½ inch.
6. To form the sides and end of the sheet bend *G*, *H*, and *I*, ½ inch, in the opposite direction from the other folds and perpendicular to the bottom of the sheet.

Are your SCHOOL SHOP files complete?

A complete file of SCHOOL SHOP is a valuable collection of projects and useful information for the shop teacher. SCHOOL SHOP will be glad to supply back numbers of any issue—beginning with the October, 1941 number—as long as the supply holds out.

Owing to the great demand for back copies, SCHOOL SHOP requests that all orders be accompanied with 25c in stamps or coin for each issue wanted. Special rates will be allowed for quantities of any one issue.

How to get a complete file:

1. State the issues you do not have—beginning with October, 1941.
2. Enclose 25c (stamps or coin) for each issue wanted.
3. Address your request to

circulation department SCHOOL SHOP

P. O. Box 100 Ann Arbor, Michigan

Every Industrial Arts Instructor Needs Our New 1942 Catalog of

"Hard-To-Get" Materials

FOR THE PAST twenty-eight years we have specialized in unusual cabinet hardware. During this period we have attained a nation-wide and enviable reputation as a source of supply on furniture hardware and devices of almost every description. Thousands of instructors, in all parts of the country, have purchased our materials and will have received our new catalog. This issue, in spite of present conditions, shows the largest line ever offered. Many new, interesting and inexpensive projects can now be made available to your classes. Send postcard today for your copy of this new catalog, free to instructors.

● THURSTON SUPPLY CO.

Anoka, Minnesota Dept. SS

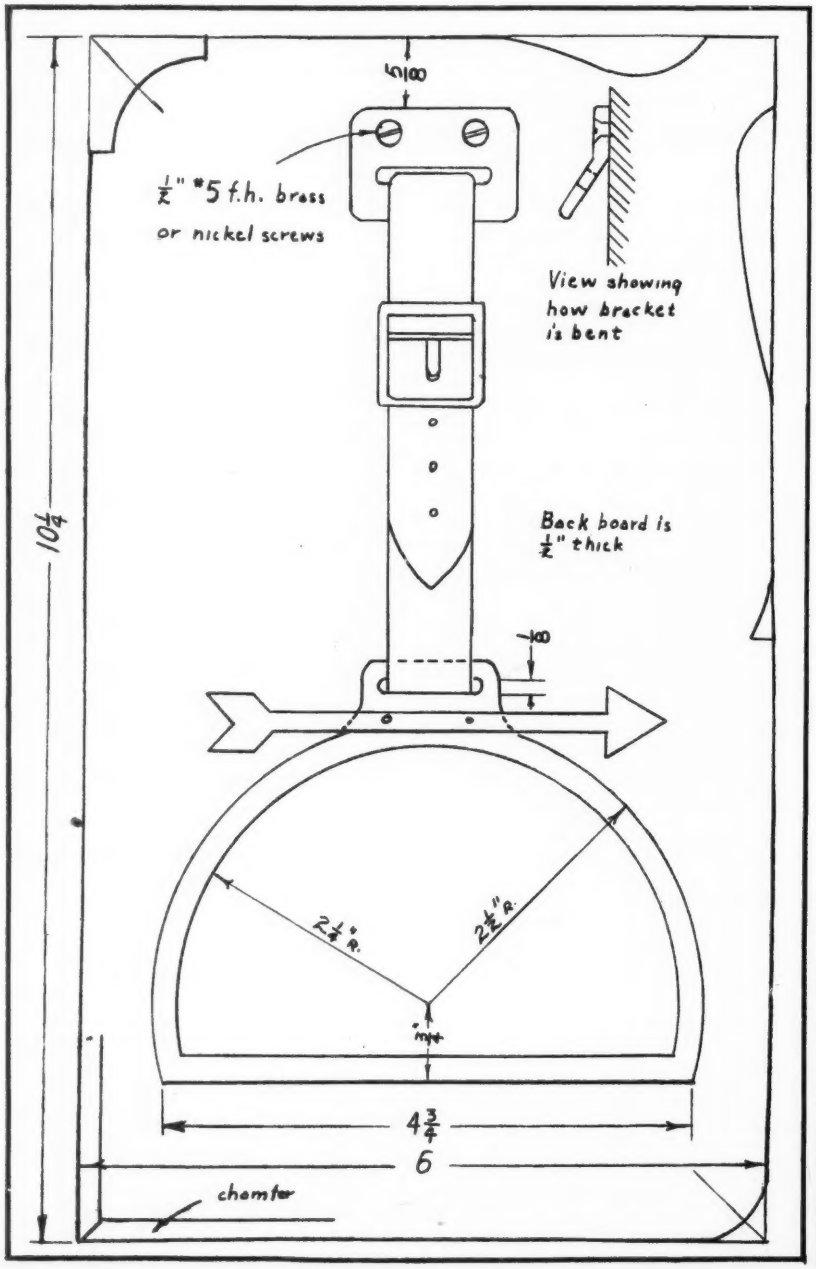
Stirrup Tie Rack

by James B. Lidstone

A handsome tie rack that the student can use in his own room—involving the use of both wood and metal. James B. Lidstone teaches in Edward Devotion School, Brookline, Mass.

THIS project serves as a teaching vehicle for the wood shop that teaches some metal work.

The backboard is made of gum, walnut, or mahogany, as these woods adapt themselves to a natural finish. Several alternate designs are shown, to provide a range of choices.



The stirrup and the bracket may be made from aluminum 1/8" thick. The pattern for the stirrup is laid out on paper divided into half-inch squares. This paper is glued, or rubber-cemented, to the metal. When the glue is dry, 1/8" holes are drilled on the inside of the stirrup for the insertion of the saw blade. The waste stock that is cut out will be used to make the bracket.

After the inside is sawed out, the outside of the design is cut.

Holes are drilled in the slot at the top of the stirrup to insert the saw blade that is used to cut the slot.

To obtain good results in smoothing the sawed edges, it is best to buy files suitable for work in soft metals. Worn-out wood cabinet files can be used, however. A bar is cut and riveted to the bottom of the stirrup.

A piece of emery cloth, wrapped around a short length of dowel rod, is used to finish the edges. Be sure to leave no sharp edges. The bracket is worked to shape, drilled, and slotted. The screw holes should be countersunk.

The bend in the bracket should be made only after some experiments have been made on scrap metal, to get the proper angle.

The arrow offers no real difficulties. It may be made of a contrasting metal.

When the tool work is completed, the metal pieces are buffed on a cloth wheel.

The leather strap may be obtained from a luggage store, hardware store, or the "5 and 10."

About seven 40-minute periods are needed to complete this project.

● Shop teachers looking for a subject on which to write a Master's thesis will find help in a mimeographed list of "Suggested Problems for Research in Industrial Arts Education" which may be secured from Professor Thomas Diamond, University of Michigan, Ann Arbor. Over 200 possible topics are included in the listing.

Motor Driven Flexible Shaft Tool at only $14.95

Pencil-size Handpiece For "Finger-Tip" Control

Student will acquire new ease and skill with the **Foredom Flexible Shaft Tool.** Performs countless tasks quickly, efficiently, on wood, metal, glass, plastics, etc. Pencil-size handpiece affords "finger-tip" control, easy accessibility. You can grind, polish, mill, engrave, sharpen, slot, etc.. Only $14.95.

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FOREDOM ELECTRIC CO.
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27 Park Pl., New York, N. Y.

NEWS FROM
industry

For items listed in this column, readers may address the firm named or write to News from Industry Dept., SCHOOL SHOP, Box 100, Ann Arbor, Michigan.

Free Instruction Books Offered by LeBlond

For the assistance of industrial and vocational schools throughout the country, R. K. LeBlond Machine Tool Co., makers of Super Regal lathes, are offering free to instructors a complete set of four helpful books as advertised on the back cover of this issue.

One copy of each book is given *without charge* to instructors. For extra copies for students, a charge of 25c per copy is made to cover handling and mailing costs.

The four books, acknowledged first-rate teaching aids, are as follows:

March of the Masters—An elaborate 52-page book presenting an inspirational story for the student machinist, plus complete specifications on all Super Regal lathes.

Running A Regal—A handy handbook for student machinists. Comprehensive instructions on all phases of lathe operation—112 pages, more than 120 illustrations.

Tool Room Grinding—A 52-page manual of tool-room grinding—just off the press. Clear and concise, amply illustrated with photographs, charts, diagrams.

America Sings—Colorful murals depicting the American scene yesterday, today, and tomorrow. Accompanied by the complete story of LeBlond machine tools.

Instructors should address their requests for free copies of these books to R. K. LeBlond Machine Tool Co., Edwards and Madison Roads, Cincinnati, Ohio.

Bradley Offers Washfountain Catalog

Bradley Washfountain Co., Milwaukee, has described its various wash fixtures and washfountains in its catalog number 4010, which may be secured upon request by addressing the company.

Sheldon Machine Co. Opens New Plant

A modern new daylight plant has just been completed by the Sheldon Machine Co., Chicago, builders of precision lathes, arbor presses, and machine vises. The new plant, financed wholly by private capital, will triple Sheldon's lathe production.

Benchwork Slidefilms Produced by Jam Handy

Jam Handy Organization, Detroit, announces the production of a series of ten benchwork training films to assist high schools, technical and vocational schools in speeding up their industrial training programs.

The films show each progressive step in bench work operations, the first film, beginning with fundamental projects, use and care of tools and measuring instruments. The other nine are devoted to specific projects: drilling; reaming; tapping and threading; finishing rough castings; scraping; layout work.

Lyon Produces New Welding Benches

Two new welding benches have been designed by Lyon Metal Products, Aurora, Ill., for use in vocational and machine shops. The first bench is designed for gas welding, with a frame

Vocational School Students Like the Wash Fixtures that All Industry Uses

Portion of the washroom in a modern vocational school. View shows three of the eight Bradley Washfountains.

● Group wash fixtures — Bradley Washfountains — provide clean running water to each of the 8 to 10 students simultaneously,—for a quick wash-up.

One Bradley takes the place of 10 single-person wash basins — so Bradleys save installation time and reduce the number of piping connections by 80 to 90 per cent.

Bradleys may be installed in new or existing buildings—they save space and maintenance expense, and reduce water consumption.

Write for our Washroom Catalog 4010 ... BRADLEY WASHFOUNTAIN CO., 2285 W. Michigan Street, Milwaukee, Wisconsin.

BRADLEY washfountains

built to support a fire-brick top. The other bench is for arc welding, and has a high shield on back and sides of the steel working-top. Both benches have shelves with separators for welding rods and storage.

Challenge Offers New Steel Bench-Plates

Small precision ground, semi-steel bench plates are a recent addition to the line of Challenge Machinery Co., Grand Haven, Mich. These plates provide an accurate plane surface for many types of assembly, layout, and inspection operations, especially in automotive and aviation work. The plates are made in nine standard sizes; and in three thicknesses.

Modern Table Lamp

(Continued from page 14)

bottle and fill in the space between neck and wood with water putty. This will dry in an hour.

6. Place a short length of ½" O. D. brass tubing in the drill press. Cover the center of the bottom of the bottle with oil and carborundum powder. With the drill press running at slow speed so as not to make the glass hot, grind through the bottle (see diagram). This operation will require about half an hour.

7. Drill ½" D. hole in center of wood cap.

8. Finish wood parts in natural color.

9. Assemble and adjust socket, cord, wood cap, pipe, and bushing.

ALTERNATIVES:

A round instead of square bottle may be used. A rubbed enamel finish over a soft fine grain wood may be preferred to a natural color finish on hard wood.

A small "night light" bulb and socket may be mounted inside the bottle as a novel addition.

Personalities . . .

HEBER A. SOTZIN has been appointed director of industrial arts in the Philadelphia public schools. He was formerly director of the Division of Industrial Arts, San Jose State College, Calif. . . . D. V. DURYEE, supervisor of the trade and industrial education division of the Michigan State Board of Control for Vocational Education, has resigned to accept an appointment as director of the metal shops, Wilbur Wright Vocational School, Detroit. . . . His successor with the State Board is HAROLD VAN WESTRIENEN, formerly director of vocational education for Hamtramck, Mich., schools. . . . LOUIS HAYES, retired Detroit principal, is acting chief of the trade and industrial education division of the Michigan State Department, replacing FRANK W. DALTON, who has joined the faculty of the University of Michigan. . . . JOHN AMOS has been named director of vocational education of Hamtramck, Mich., schools. . . . JOHN A. KARSNITZ now teaches industrial arts at Palmyra, Penn., Junior-Senior High School. . . . C. J. KING has been newly appointed to the South Carolina State Department of Education as supervisor of trade and industrial education. . . . CHESTER HOYT and LEROY CHARLICK are new industrial arts teachers at Highland Park, Mich., Junior High School. . . . MAX R. KLEIN, formerly instructor in national defense training courses, Cleveland, has been appointed director of the Educational Museum, Cleveland, Ohio. . . . BENJAMIN FREEMAN COMFORT, for 30 years principal of Cass Technical High School, Detroit, Mich., died recently at the age of 78. He had been in retirement since 1934. . . . ARTHUR E. PEARSON, former machine shop teacher at Hackley Manual

Wanted—Manuscripts

School Shop is seeking short, practical articles on shop subjects. Payment will be made on publication for material used. Articles are wanted in the following subjects:

Woodworking	***Electrical shop***	***Mechanical drawing***
Metalworking	***Handicrafts***	***Auto mechanics***
Machine shop	***Ceramics***	***Aeronautics***
Graphic arts	***Textiles***	***Etc.***

Descriptions of courses of study and curriculum changes are also desired as well as short items of a paragraph or two describing helpful practices in the school shop.

When preparing manuscripts, please keep the following points in mind:

1. The manuscript submitted should not have been published elsewhere.
2. Manuscripts should be typewritten and double spaced.
3. Title of the manuscript should be followed by the name and teaching position of the author, including the name of the school.
4. Illustrations will greatly enhance the value of manuscripts. Provide, if possible, large glossy photographs.
5. Line and working drawings and detail layouts should be as complete as possible, with lettering in black ink.
6. Drawings, illustrations, and photographs should include name of author and self-explanatory titles or legends.
7. Descriptions of projects should include complete list of materials, average time for completion of the project, and a few words on the educational value of the project.

Manuscripts should be addressed as follows:

THE EDITOR

SCHOOL SHOP

P. O. BOX 100, ANN ARBOR, MICHIGAN

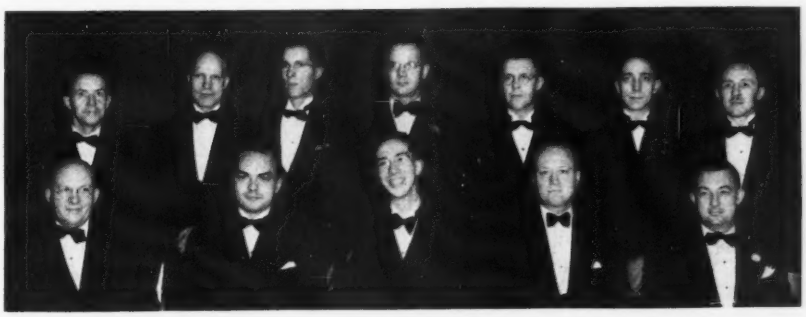
Training School, Muskegon, Mich., has returned to the teaching profession, now at Wilson Junior High School, Muskegon. . . . MARSHALL ELSON is now teaching metal work at Lincoln Junior High School, Pontiac, Mich. . . . WALTER BILLIET, formerly of Hastings, Neb., now teaches auto mechanics at Fordson High School, Dearborn, Mich. . . . RICHARD HADRICH, formerly of Trout Creek, Mich., is teaching drafting at Maple Junior High School, Dearborn, Mich. . . . HAROLD FISHER is teaching drafting at Eastern Junior High School, Pontiac, Mich. He taught formerly at Mt. Vernon, Iowa. . . . THOMAS H. ALFORD, Livonia, N. Y., publisher, is now a member of the faculty of Rochester, N. Y., Athenaeum and Mechanics Institute, Department of Publishing and Printing. . . . EUGENE MORRISON now teaches metal shop in Maple Junior High School, Dearborn, Mich. He formerly taught at Clio, Mich. . . . . EARL G. DARBY, for 18 years industrial arts teacher at Manhattan, Kan., has accepted a position in the shop practice department of Kansas State College at Manhattan. . . . JACK MCCALLUM is teaching auto mechanics and electricity in the new shop at Woodworth Junior High School, Dearborn, Mich. . . . CLAUDE H. EWING, has been placed in charge of the new curriculum department of Washburne Trade School, Chicago. . . . Officers for the year 1941-42 have been elected by the Westchester County, N. Y., Industrial Arts Club: president, HERBERT F. LINDSTROM, Mamaroneck; vice-president, NORMAN C. FERGUSON, North Tarrytown; treasurer, RONALD HINTZ, New Rochelle; and secretary, OLIVER W. KENDALL, Mount Vernon. . . . EDWARD R. CHURCH is the new general shop instructor at Public School 40, Paterson, N. J. . . . RAYMOND SCOTT has resigned his position with the Lapeer, Mich., schools to become head of the industrial arts department of the Everett School, Lansing, Mich. . . . DR. KENNETH F. PERRY, of the Division of Arts, Colorado State College of Education, Greeley, has been promoted to the chairmanship of the Division. He succeeds Miss GRACE BAKER, upon her retirement. . . . WAYNE GRUBB, previously of Burns, Oregon, schools, now teaches in the Tehachapi, Calif., Union High School. . . . HERO J. APPELBERG is teaching metal work in Washington Junior High School, Pontiac, Mich. . . . CLIFFORD MCGOVERN, for several years supervisor of industrial arts in the Klamath County, Oregon, schools, has accepted a position teaching industrial arts at the new McKenzie River Union High School, Blue River, Ore.

WHAT'S DOING IN THE FIELD

news

OF INDUSTRIAL EDUCATION

NEW publication in the industrial arts field is the West Virginia Industrial Arts Association *Newsette*, Vol. 1, No. 1 of which appeared in October, 1941. The publication is sponsored by the West Virginia Institute of Technology as a service to industrial arts instructors. Editor of the four-page newspaper-style publication is Fred W. Eberle of Montgomery. Issued twice yearly, the paper will be sent to industrial arts instructors and school administrators, as well as members of the Industrial Arts Association.



TWELVE men were initiated into Mu Sigma Pi fraternity of Wayne University, Detroit, Mich., recently at the annual banquet and initiation held at the University Club, Detroit. Those initiated were (above, standing, left to right): Clyde Skinner, Marshall Byrn, Leroy Charlick, Julius Nelson, Carl Turnquist, Edwin Rowley, and William Jumer; and (above, seated) Dean Cook, Hartley Schaal, G. Manson Taylor, Frank Riess, and Theodore Hoover.

Toastmaster at the banquet was Dr. George E. Myers, professor of vocational education at the University of Michigan. George Fern, director of the State Board of Control for Vocational Education was the speaker. Guests of honor were Dr. John H. Trybom, director emeritus of vocational education, Detroit schools, and Dr. Earl C. Kelley, associate professor of education, Wayne University, Delmar Pardonnet, teacher at Hutchins Intermediate School, Detroit, was general chairman of the banquet.

Officers of the fraternity for the year are: president, G. Harold Silvius; vice-president, Ernest G. Gardner; recording secretary, Frank C. Gordon; corresponding secretary, A. G. Whitney; and treasurer, Frank Updegraff.

ENROLMENT increases in trade and industrial classes in the Central U. S. region total 16.7 percent, reports N. B. Giles, Central Regional Agent, U. S. Office of Education. States in this region are Kansas, Nebraska, North and South Dakota, Minnesota, Iowa, Missouri, Kentucky, Illinois, Wisconsin, Michigan, and Indiana. Missouri alone reports a growth during the year of 35 percent.

SPECIALISTS in certain industrial education fields are wanted for teaching positions in Brazil, the U. S. Office of Education reports. Woodworking, domestic arts, internal combustion engine construction, aircraft construction, design and production of industrial art and leather work, metalworking, casting, electro-chemistry, stoneworking, plastering, tanning, iron, steel and glass production are the fields for which teachers are sought. Information may be had from the Office of Education, which is assisting the U. S. Employment Service in making these opportunities known.

THE Coordinator of Inter-American Affairs of the NEA has announced the establishment of the Inter-American Trade Scholarship program, whereby young men from other American nations will be brought to the United States for vocational training.

Students brought to this country will work side by side with American citizens in factory "overall" jobs, at the same rates of pay and under similar conditions. In addition, courses in orientation, technical English, and United States methods will be given.

INTENSIVE training will be given to more than 200,000 "lead men" and supervisors in defense plants during the next six months, under an expanded training-within-industry program announced by OPM associate director-general Sidney Hillman. Success of the test program in New Jersey has indicated the value of this type of training, which it is hoped will be expanded to reach the entire country.

What Do You Think?

What do you consider the best method of tool storage and checking?

▸ Says Harold A. Clark, Head, Vocational Education Department, Public Schools of the District of Columbia, Washington, D. C.:

Is there a best method of tool storage and checking? All of us will agree to the oft repeated phrase—"A place for everything and everything in its place." For one type of shop it means employing quite a different method from that used in another. Also, we find different teachers in similar shop situations who use different methods with equally good results.

In general, however, it does seem to me that for most shops a system must be devised so that it is fairly easy to know where and how the various tools belong. Some instructors number their tools and have corresponding numbers in the place where they belong, others have outlines of the tools on boards, etc.; both are good.

Where possible I personally prefer a toolroom where a boy from the class is assigned for so many periods as toolroom clerk. When properly organized and administered, this system has the advantage of being an ideal teaching situation as well as a good checking method for tools.

▸ Says Heber C. Taylor, head of the Industrial Arts Department, Oak Park and River Forest Township High School, Oak Park, Illinois:

Many different plans have been worked out for checking shop tools and equipment. In order to have any plan work there must be complete cooperation among all who are responsible: department head, teacher, pupils, house men, etc.

The plan used will depend somewhat on the type of shop, arrangement of equipment, and age of pupils.

First, each shop should have a complete inventory of all equipment for which the teacher is responsible. This should be checked at the beginning and close of each semester or year. This should show, first, the complete list of equipment at beginning of term; second, the tools broken, worn out, or missing; third, the new tools added; and fourth, the final inventory. Our individual shop tool-checking system is simple and organized so as to use as little of the class period as possible. Edged tools are individual and kept locked in the pupil's drawer at his work station. Other tools used every day are kept in a common drawer at the work station, checked and locked by each pupil at the end of the class period.

All other tools are kept in the toolroom in charge of one or two members of the class. Tools are issued to pupils as demanded. The name of the pupil and the name of the tool is recorded on the tool check sheet with space for "out" and "in" check. This sheet is 8½" x 11". At end of each period the tool check sheet is delivered to the teacher by the toolroom attendant. These are filed for future reference if necessary. Record should also be kept for tools demanded but not available so as to help determine necessary additions to equipment.

We are also experimenting with the open tool panels in general metal and automobile shops. Each unit or division of the course has a tool panel at the work station. On this panel are the tools necessary for the division, open and easily checked at the end of each class period. Of course a toolroom is necessary for tools used in the various divisions. We will be able to report later on the success of this experiment. The problem of checking tools has never been a difficult one with us.

● From the annual report of the School Department of Brockton, Mass.:

The most valuable attribute of the trained high-school boy is his mechanical resourcefulness, his mechanical adjustability to job conditions, enabling him to shift as required from one position to another.

In the industrial arts department, the main purpose is to give information and training with respect to industrial facts and processes that will tend to promote interests and establish habits of thought and action that will be of value to the individual, without particular respect to his future vocation.

The individual develops through his experience. In order to develop him into the man we wish him to be, we must provide experiences which will contribute to that end.

Since we do not know the vocations in which the individuals will engage, it is necessary to give them experiences that will be of value to them without respect to their vocations. These purposes, for the development of which experiences must be provided, are as follows:

1. A well-developed interest in industrial affairs.
2. An ability to care for and use properly the things we buy.
3. An appreciation of good workmanship and good design.
4. An attitude of pride or interest in one's ability to do things.
5. A feeling of selfreliance or confidence in one's ability to take care of oneself in an unusual situation.
6. A habit of orderly and methodical procedure in the performance of any task.
7. Knowledge and understanding of the conventions of mechanical drawing, and the ability to express one's idea accurately by means of a drawing.
8. Elementary skills in the use of the more common tools and machines, and in the methods of modifying and handling materials, in order to make them conform to our needs.

« PLASTICS »

***GENERAL PLASTICS*—Cherry**

Presents the fundamental operations, related information, and many interesting and valuable projects in plastics. A list of tools and supplies is given. The fundamental operations needed to fabricate the cast phenolic resins with hand tools are well illustrated. Layouts and step-by-step procedure for each project.

Single copy, list price $1.20

McKNIGHT and McKNIGHT

Bloomington, Illinois

Changing Address?

ARE you moving to another school in your system? Or to a school in another town?

Then please advise SCHOOL SHOP of your correct new address, keeping in mind the following points:

- Give your school address.
- Include the specific subject you teach, e.g., woodworking, drafting, etc.
- Give your old address, without fail.
- Address your notice to

circulation department SCHOOL SHOP

Box 100, Ann Arbor, Michigan

IN THE Morning Mail...

Brief comments about SCHOOL SHOP *and the field it serves are invited. Address the Editor,* SCHOOL SHOP, *Ann Arbor, Michigan.*

Gentlemen:

The first copies of your publication were excellent. SCHOOL SHOP fills a need which has existed for a long time. Keep it up.

FRANK J. DENNEHY
Instructor in Electricity
Rindge Technical School
Cambridge, Mass.

Gentlemen:

A copy of the November issue of SCHOOL SHOP recently came to my attention, and I think it is a fine publication.

The article "Be Specific" by M. F. Foss is very good, and I plan to use it as suggested.

NORMAN A. KROPF
Peekskill Senior High School
Peekskill, New York

Gentlemen:

SCHOOL SHOP is a fine publication; in fact, it is superior to similar magazines being published when I was teaching shop work some 16 years ago.

I have just returned to teaching after having been in business since 1926. I will look forward eagerly to issues of SCHOOL SHOP that will follow.

O. G. REIVES
Crook County High School
Prineville, Oregon

(Congratulations to reader Reives upon his return to teaching.—*Ed.*)

Gentlemen:

I am quite pleased with SCHOOL SHOP and feel there is a definite need for a publication of this type.

I hope you will find it possible to conduct a "Live Letters Column" where instructors, administrators, etc., can offer comments regarding articles published.

CHARLES QUINLAN, JR.,
Director of Industrial Arts
Stratford, Conn., High School

(SCHOOL SHOP's letter column will be as "live" as its readers make it. Comments on articles or anything else are welcome.—*Ed.*)

Gentlemen:

I recently became acquainted with your publication SCHOOL SHOP and am much impressed by it. Keep up the good work. . . .

HAROLD C. MILLER
Coordinator, Trades & Industries Dept.
Van Wert, Ohio, City Schools

Gentlemen:

SCHOOL SHOP is a splendid magazine, and I am sure it will contribute much to the general growth of shop work. . . .

FRANK T. FEE
Hutchinson, Kan., Public Schools

Gentlemen:

You are to be congratulated on the fine character of your new publication so much needed in the field of modern technical education.

Especially pertinent is the "Washington Letter," which fills a void on information of great value that has so long been generally overlooked.

J. A. BRADFORD
Sumner High School
Kansas City, Kansas

Gentlemen:

May I take this opportunity to congratulate you on the first and second editions of SCHOOL SHOP. I am sure that your magazine will be welcomed by every shop teacher. All of my teachers have been very enthusiastic over SCHOOL SHOP. . . .

J. H. ASKINS
Goldsboro, N. C., High School

Gentlemen:

Please add my name to your mailing list for SCHOOL SHOP, and send me a copy of No. 1. I think it is a grand magazine and you are doing an excellent piece of work for shop teachers. . . .

MALCOLM T. HOWELL
Burlington, N. C., High School

(SCHOOL SHOP can supply readers with back copies as long as the supply holds out . . . don't forget to enclose 25 cents in stamps or coin for each back issue wanted.—*Ed.*)

Gentlemen:

I have received the first issues of your SCHOOL SHOP magazine, and think it is a dandy. My own comment is about the size—easy to handle and just right for filing.

HIRAM E. JACKSON
Head, Vocational Dept.
Greusel Intermediate School
Detroit, Mich.

Gentlemen:

I delayed answering your request for an article on the subject "Are you using the unit or general shop type of organization, and why?"

I am sorry, but to answer such a question directly for a large city like Buffalo is impossible. We are using both types of organization and some which have partial features of each type. For example, in some of our larger schools where we have four or more shops with four full-time teachers, the work is just naturally organized on a unit shop basis. In these so-called unit shops, however, the tendency is to generalize the work; i.e., in our unit metal shop in such a school where the basic equipment was possibly for sheet metal work, we have expanded the program to include art metal work, foundry work and forging, and heavy iron work. If such a unit included a print shop, we have expanded the work to include bookbinding, photography, wood-block cutting, etc.

In other words, we believe in the general or composite shop idea and are gradually changing all our shops to accommodate two or more shop activities. In the establishment of new shops we are deliberately planning to include at least six activities, the exact nature of which to vary somewhat with local conditions.

I am thoroughly convinced that the philosophy of industrial arts education as expressed by Frederick G. Bonser is a sound one. It was out of this philosophy that the expanded industrial arts education program grew, and the general shop is the only kind of physical set-up which permits this type of training to be effectively worked out.

STEWART F. BALL
Supervisor of Industrial Arts
Buffalo, N. Y., Public Schools

(MR. BALL was invited to contribute to the symposium on the question-of-the-month in the December issue. His letter, however, was received too late for inclusion, and so is printed here.—*Ed.*)

FAN-MAIL DEPARTMENT

JOHN ORBAN, JR., author of the Project-of-the-Month, "A Prize-Winning Telescope," appearing in the October SCHOOL SHOP, writes that several schools have written for complete plans for the telescope. Mr. PERCY MYGRANT of the Brooklyn School of Automotive Trades has visited Garden City to see the telescope and a delegation of students from the Astronomy Club of the Manhattan School of Aviation Trades also journeyed to Garden City for inspection purposes. Numerous other inquiries have come to Mr. Orban and he has had several invitations to speak about the project before various groups.

Gentlemen:

I have been the recipient of the first issues of your bright and scintillating publication. Accept my sincere thanks and congratulations.

SCHOOL SHOP is all "meat" and I predict a long and prosperous future for it. Keep up the good work.

WILLIAM L. KELLY
Samuel Gompers Vocational High School
Bronx, New York

Gentlemen:

I greatly appreciate and heartily welcome this new magazine for the shop teacher. My many years of work in industrial arts have convinced me of the prime importance of a magazine giving major emphasis to suitable shop projects.

Let's work together in offering to shop teachers, both old and new, the best and most suitable projects our profession can offer. After all, the essence of our philosophy is "learning by doing." Let us see to it that there are more worth-while things to do.

A. W. DRAGOO
Assistant Professor, Industrial Arts
Illinois State Normal University
Normal, Ill.

Gentlemen:

. . . I wish to compliment you on both the contents and general appearance of SCHOOL SHOP. I am sure this new publication will be of great value to all teachers of industrial arts . . . especially to new teachers in the field.

GORDON O. WILBER, Acting Director
Industrial Arts Teacher Education
State Normal School
Oswego, N. Y.

Gentlemen:

From the text of your introductory issue, I feel that SCHOOL SHOP will make a definite

Student Control

OF SHOP SERVICE RESPONSIBILITIES

by **J. Lyman Goldsmith**

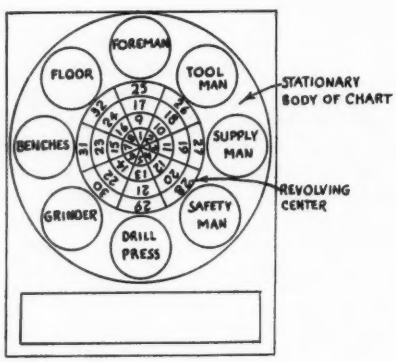
With the great emphasis being given citizenship training, practical techniques for teaching democratic attitudes are particularly timely. This article describes several. J. Lyman Goldsmith is Supervisor of Elementary School Industrial Arts in the Los Angeles, California, Public Schools.

A CLEAN, well-organized shop is a mirror-like reflection of the instructor in charge. The wide-awake shop teacher realizes that shop service responsibilities have a double value: first, that of contributing to the students' realization of orderliness and cooperation; and second, that of providing first-hand participation in a living example of democracy at work. The boy who can accept a responsibility and carry it to completion has contributed to the class welfare and to his own development. In addition to providing citizenship values, student management of the shop allows the teacher more time for effective individual and group instruction.

Some form of rotation of shop service responsibilities is desirable so that each student will hold a number of different jobs during a semester. In this systematic change of service duties, all pupils should be treated alike, making for a democratic spirit.

Three types of shop responsibility charts are in general use in the shops of the Los Angeles City School System—shops ranging from elementary school through high-school and trade-school level. These charts assign "clean-up" jobs in a fair impartial manner, allowing each boy not only to sweep the floor and clean off the benches, but also to act as shop foreman. With frequent rotation of the charts, no one student is required to hold a job for a long period of time. Boys are represented on each chart by shop numbers which are assigned by an alphabetically arranged list of the class.

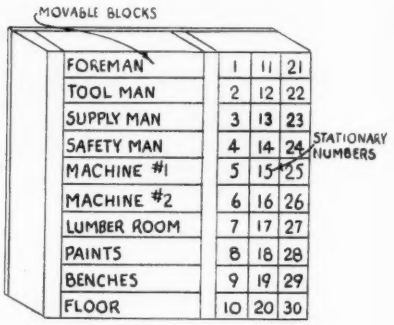
The charts themselves can be easily constructed of plywood, masonite, or cardboard—using attractive colors to appeal to "boy interest." The originality of these charts is covered by years of use—hence it is impossible to give credit for their origin to the proper individuals.



The first chart illustrated has a revolving center with 32 numbers which is turned one division periodically, thus rotating the numbers in charge of specific jobs. In practice, the assignment of numbers to the various jobs may be varied by changing the various rings of numbers responsible for the jobs.

The second type of chart in common use can be made of cardboard or heavy graph paper. This chart assigns jobs for definite dates, with the instructor or shop foreman crossing off the completed assignments. Needless to say, these suggestions may be altered in any way to suit individual teacher requirements.

CLEAN-UP JOBS	SCHEDULE — DATES (Jan 5 to 9)	ETC.
FOREMAN	1 2 17 18 15 16 13 14 11 12	
TOOL MAN	3 4 1 2 17 18 15 16 13 14	
SUPPLY MAN	5 6 3 4 1 2 17 18 15 16	
SAFETY MAN	7 8 5 6 3 4 1 2	ETC.
LUMBER ROOM	9 10 7 8 5 6 3 4	
PAINTS ROOM	11 12 9 10 7 8 5 6	
MACHINES	13 14 11 12 9 10 7 8 5 6	
BENCHES	15 16 13 14 11 12 9 10 7 8	
FLOOR	17 18 15 16 13 14 11 12 9 10	


MOVABLE BLOCKS
FOREMAN 1 11 21
TOOL MAN 2 12 22
SUPPLY MAN 3 13 23
SAFETY MAN 4 14 24
MACHINE #1 5 15 25
MACHINE #2 6 16 26
LUMBER ROOM 7 17 27
PAINTS 8 18 28
BENCHES 9 19 29
FLOOR 10 20 30
STATIONARY NUMBERS

A third type of shop service assignment device is illustrated. In practice, the bottom block is changed to the top position at regular intervals of time, resulting in a change of jobs.

Under no circumstances should "clean-up" jobs be assigned as a punishment. Service duties should be considered as a definite part of each student's shop experience to be done cheerfully and willingly. The attitude of the student toward these service assignments is largely dependent on the manner in which the instructor first presents the importance of the shop organization.

The number of shop assignments will vary according to the school, the shop, and the teacher. Some instructors will have an elaborate system, while others will be satisfied with a simple arrangement. The important thing is to have a definite system which will insure the teacher a clean, well-organized, student-controlled shop.

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contribution to those of us engaged in teaching industrial arts as progressive education.

JOSEPH W. SLYVA
Weeks Junior High School
Newton Centre, Mass.

Gentlemen:

I would like to compliment you on the make-up of the first issues of SCHOOL SHOP. There is a very fine balance between articles and projects. I am sure the response you will get from the industrial arts men over the country will be enthusiastic.

V. L. PICKENS
Director of Practical Arts
Kansas City, Mo., Public Schools

Gentlemen:

I want to compliment you on the splendid first two issues of your new SCHOOL SHOP magazine. I have taken the occasion to discuss this very fine professional effort of yours with several individuals and we feel that you are to be commended for the unusual policy underlying the publication of this new magazine. The members of our staff are very much interested in your efforts and would be glad to be of any help to you that we can at any time we may be called upon.

SYLVAN A. YAGER, Chairman
Industrial Arts Department
Indiana State Teachers College
Terre Haute, Ind.

instructional resources

Inquiries concerning materials described in these columns may be addressed to SCHOOL SHOP, Box 100, Ann Arbor, Mich., and will be passed on to the proper firm or person.

Books

Woodworking Projects and Upholstery. Baxter and Lackey. New York: D. Van Nostrand Co., Inc., 1941. Pp. ix + 251. $2.50.

First 12 chapters deal with hand and power tools, their care and use. Followed by a series of projects varying in complexity. Chapter 14 deals with the principles and technics of upholstering, use of which is made in some of the projects outlined in Chapter 13. Illustrated with photos and diagrams; index.

Do You Want To Be A Foreman? Albert Walton. New York: McGraw-Hill Book Co., 1941. Pp. x + 165. $1.25.

This is neither a classroom textbook nor a treatise on foremanship, but a volume of personal advice to the man in industry with the desire to attain foremanship status or higher. The author discusses the relationship of the foreman to his job, to his employer, to the workmen under him, as well as the mental attitudes and personal characteristics that go into the making of a good foreman. Indexed.

General Leathercraft. Raymond Cherry. Bloomington: McKnight & McKnight, 1940. Pp. 79. $ .72.

In four parts: related information; operations; projects; and designs. Of especial value are the excellent illustrations, covering every phase of the operations comprising leatherworking. Projects are interesting and useful. The design section contains patterns for tooling figures on various leather articles.

Machine Trades Blueprint Reading. Ihne and Streeter. Chicago: American Technical Society, 1941.. Pp. 157. $2.00.

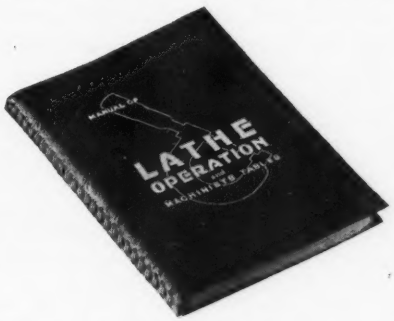
Essentially a workbook in blueprint reading for the machine shop worker. Consists of a series of blueprints with related question sheets of increasing difficulty. Glossary of shop terms; diagrams; tables; information on drafting procedure.

Manual of Instructions in Welding and Cutting. B. E. Rossi. New York: McGraw-Hill Book Co., Inc., 1941. Pp. viii + 99. $1.00.

A series of shop assignments covering all phases of electric and oxy-acetylene welding and cutting. Assignments on equipment, setting up of apparatus, and on welding various types of joints. Includes work in brazing, bronzing, and welding of steel, cast iron, copper, and aluminum. Illustrated with photographs and drawings.

Manual of Lathe Operation. Kalamazoo: Atlas Press Co. Pp. 238. $1.00.

Covers all phases of lathe operation: cutting tools, machining of materials, holding work, drilling, threading, attachments, and woodturning. Also reference tables; index; blank pages for notes. Thumb indexed; well illustrated. Chapter on the theory of metal cutting.



Practical Air Conditioning. Rummel and Vogelsang. New York: John Wiley & Sons Co., Inc., 1941. Pp. vii + 282. $2.75.

Concerned with the practical aspects of air conditioning, for those in, or intending to enter, the air-conditioning industry. Covers principles, general information; chapters on air-conditioning systems, refrigerating equipment, ventilation, sound control, automatic controls, pumps and piping, electric fundamentals, and other phases of air conditioning. Photographs, diagrams, charts, index.

Films

Aviation Engine: Disassembly and Inspection. Brandon Films, Inc., 1600 Broadway, New York, N.Y. 2 reels; 16 mm.; silent or sound.

Of value especially where actual airplane engine is not available. Shows major units of radial engine, as well as sub-assemblies. Produced in cooperation with Missouri Aviation Institute.

Construction Procedure for Small Extension Type Coffee Table. 1100 feet, 3 reels, 16 mm., running time 40 min. Albert Constantine and Sons, 797 E. 135th St., New York, N. Y. Nonadvertising.

Directed by Herman Hjorth. Shows proper method of hand and machine operations. Available for classroom use; fee: transportation and insurance costs.

Exhibits

Graphic Arts Exhibit—Division of Graphic Arts, U. S. National Museum. Washington, D. C.

The Division of Graphic Arts of the United States National Museum at Washington maintains seven traveling exhibits illustrating the various processes of the graphic arts. They are for use of schools, colleges, libraries, and other organizations interested in "How Prints Are Made."

Each of the seven exhibits contains the same information, illustrating and describing briefly the processes involved in wood engraving, photo-lithography, silk-screen printing, rotogravure, and other processes of graphic arts.

The exhibits may be borrowed for monthly periods provided the exhibitor pays express charges incurred in receiving and forwarding the exhibit. Further information may be obtained from the United States National Museum, Washington, D.C.

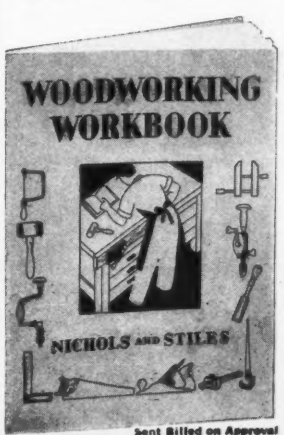
New Bulletin for Lithographers

Of interest to teachers of offset printing and lithography, as well as printing in general, is *Harris Impressions*, a four-page bulletin containing information on offset printing. Published by Harris-Seybold-Potter Corporation, Cleveland, Ohio.

'Fight for Freedom' Films Produced by Brandon

A special National Defense Bulletin of motion pictures dealing with the world-wide fight for freedom is now available to schools, announces Brandon Films, 1600 Broadway, New York. The Bulletin is a reference guide to Brandon films, containing synopses and details as to how the movies may be obtained.

The films, sound pictures of 16 mm. width, portray events "Inside Europe," "Inside Asia," and "Inside Germany." There is also a series of films from Britain and Soviet Russia. These films, it is said, are excellent for use in civilian defense and patriotic programs.



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Sign, clip and mail for an approval copy SS1

The Manual Arts Press, *Peoria, Illinois*

Name .....

St. and No. .....

City and State .....

Position and School .....

Washington Letter

by **Alan Murray**

"ANY experience?"

"No, sir."

"Any training in school?"

"No, sir."

"Fine. I think you're the lad we need."

This imaginary conversation is by no means implausible, under a program just inaugurated by the Army Air Corps for training and later employing several thousand young men for aircraft work. The U.S. Civil Service Commission is accepting applications from those wishing to take an examination. Neither experience nor training of any kind is considered, the basis of selection being mechanical aptitude as shown in a test.

The training courses are scheduled to last six months, during which the trainee receives subsistence, amounting to about $50 a month. Upon graduation, he is given a civil-service job with the Army Air Corps paying from $26 to $32 a week. Age limits are 17 and 25.

Although the Navy has had for years a four-year apprenticeship program for civilian workers, this is the first instance of short training courses in which the students are financed by the federal government. Industrial arts and vocational teachers can choose between feeling annoyed that the value of their work is being snubbed in the selection provisions, and feeling elated that the establishment of this principle may lead to its application to their own pupils in the future.

● The importance of industrial arts courses in a long-range defense program is being given increasing thought in Washington. With the ranks both of industrial arts teachers and of secondary school pupils being rapidly depleted because of employment offers from industry, a serious problem is being created. In a recent article in *School Life*, by Consultant Maris M. Proffitt of the U. S. Office of Education, entitled "Industrial Arts—a Foundation for Mechanized-Warfare Training," the point is made that "In an emergency—one that demands the greatest possible speed in providing the superstructure that is to function for meeting the emergency—consideration of an adequate foundation is frequently neglected and only a temporary one is provided. Unless the emergency is only a threatening cloud upon the horizon, the temporary foundation will not long bear the weight of the functioning superstructure." A good many planners are beginning to agree with his conclusion: *"If adequate funds are made available for the purpose, industrial arts courses in the high schools of America can contribute, as no other means can, to the basic preparation of the source of supply for qualified labor to meet defense needs."* Italics ours.

● What may be the beginning of the federalization of present State Employment Services is seen by some in the appointment early in December of John J. Corson as new director of the U.S. Bureau of Employment Security and the U.S. Employment Service. Not long ago the Arizona Employment Service was in effect taken over by the federal organization, when it ruled that requirements for eligibility to receive federal funds were not being met and they were withdrawn. It now operates as a branch of the U.S. Employment Service. The employment service set-up is similar to that of vocational education, with the states matching federal funds. Because coordination between states in meeting employment problems due to migration and the defense program is urgently needed, a system of clearances under federal operation is advocated. While nothing is being said officially, it is possible that the Arizona action is the first of many more like it.

● Reports coming to the Nation's capital are that an increase can be observed in the employment of Negroes in defense industries. It is not large but significant. Oddly enough, the reports also say that there is less difficulty in persuading employers to hire Negroes than in persuading some schools to give them the requisite training.

● Now effective is a preference rating of A-5 to high-school and college laboratories and others engaged in research and testing, for the acquisition of scarce materials required by manufacturers of necessary laboratory chemicals and equipment.

● In addition to growing opportunities for girls in the aviation field, mentioned here recently, an increase is reported in engineering calculations work for women. In a broadcast, Miss Emily T. Hannan, head of the turbine calculations department of the General Electric Company, said: "The idea of using girls for engineering calculations work is growing by leaps and bounds." She advised interested girls to include science courses, preferably physics, in their high school and college work, along with such branches of mathematics as algebra, trigonometry, and calculus. We might add that introductory shop courses would also be valuable.

● Considerable progress is reported in the establishment and functioning of representative state and local advisory committees in connection with vocational education programs. C. E. Rakestraw, Consultant in Employer-Employee Relationships for the U. S. Office of Education, is active in working with these committees, and cooperates closely with designated representatives of both the CIO and AFL in helping to adjust grievances forwarded to Washington. There are 48 committees functioning on the state level, and approximately a thousand on the local level. The defense training program has augmented the number of the committees, which are said to be valuable in planning programs of pre-employment, refresher, and supplementary training.

This Month's Cover

THE two lads on the front cover of this issue are students in the building trades course at Cass Technical High School, Detroit, Michigan, specializing in carpentry. As part of their course, they construct scale-model houses, using standard building techniques. This photo is courtesy of the Visual Education Department of the Detroit, Michigan, Public Schools.

Last month's cover picture showing a boy planing the hull of a sailboat was taken at Taft High School in Chicago and was reproduced in SCHOOL SHOP through the courtesy of Louis V. Newkirk, Director of Industrial Arts in the Chicago Schools.

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